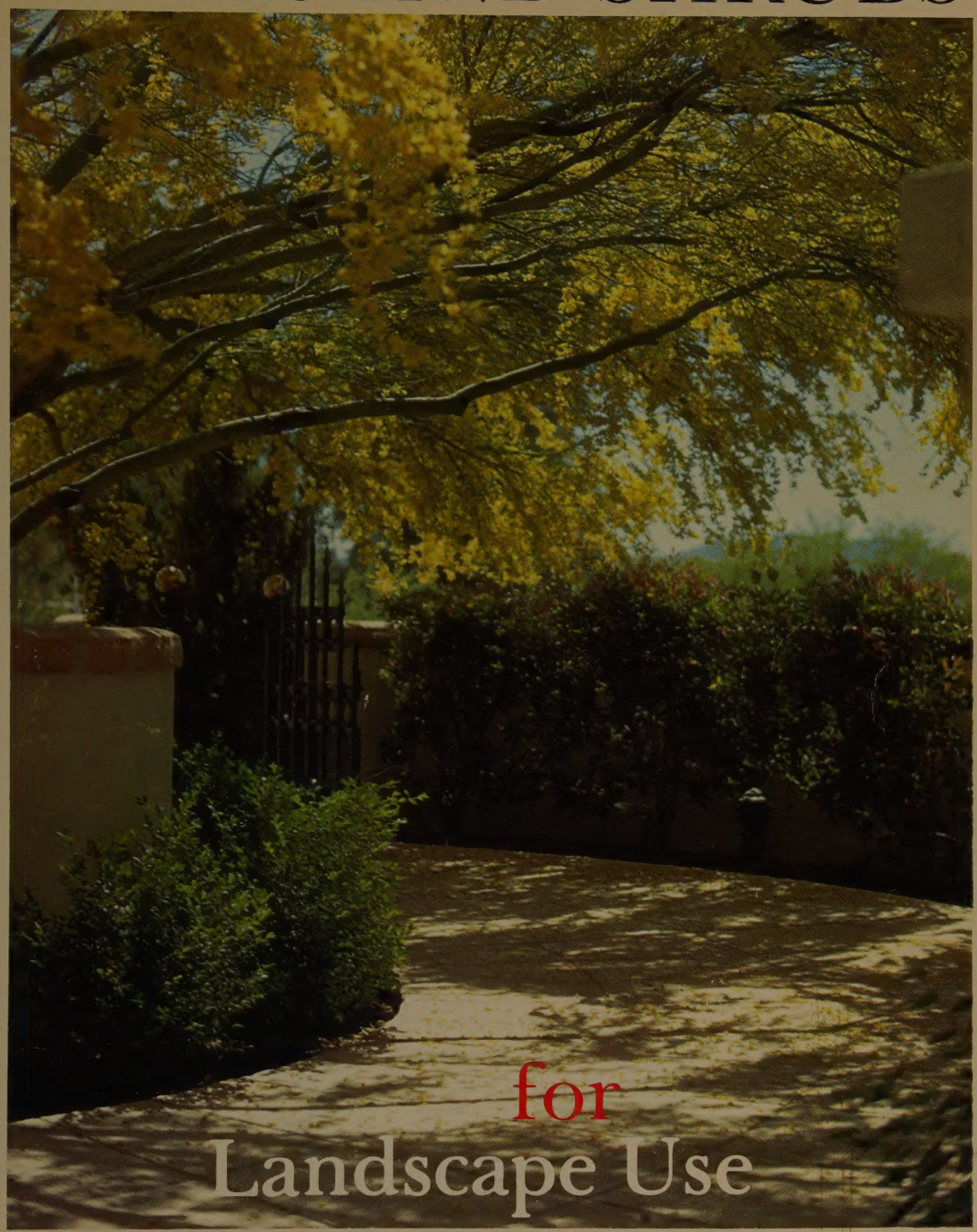
Native TREES AND SHRUBS



for Landscape Use in the Desert Southwest

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Bulletin A 82

Native Trees and Shrubs for Landscape Use in the Desert Southwest

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Over 30 feet

Ash, Arizona, *Fraxinus velutina*
Cottonwood, Fremont, *Populus fremontii*
Oak, Arizona White, *Quercus arizonica*
Oak, Emory, *Quercus emoryi*
Sycamore, Arizona, *Platanus wrightii*

20 to 30 feet

*Acacia, Sweet, *Acacia farnesiana*
Hackberry, Netleaf, *Celtis reticulata*
Ironwood, *Olneya tesota*
*Mesquite, Chilean, *Prosopis chilensis*
*Mesquite, Common, *Prosopis juliflora*
*Palo Verde, Blue, *Cercidium floridum*
Tamarisk, *Tamarix aphylla*
Elder, Mexican, *Sambucus mexicana*

**Attain this size when planted in deep soil and watered adequately*

10 to 20 feet

Acacia, Sweet, *Acacia farnesiana*
Elder, Mexican, *Sambucus mexicana*
Feather Bush, *Lysiloma thornberi*
Mesquite, Chilean, *Prosopis chilensis*
Mesquite, Common, *Prosopis juliflora*
Mesquite, Screwbean, *Prosopis pubescens*
Oak, Mexican Blue, *Quercus oblongifolia*
Palo Verde, Blue, *Cercidium floridum*
Palo Verde, Little-leaf, *Cercidium microphyllum*
Palo Verde, Mexican, *Parkinsonia aculeata*
Soapberry, Western, *Sapindus saponaria*

**not native*

PLANT USE CATEGORIES

Windbreaks and Screens

Over 30 feet

Alligator Juniper, *Juniperus deppeana*
Cypress, Arizona, *Cupressus Arizonica*

20 to 30 feet

Acacia, Catclaw, *Acacia Greggii*
Acacia, Whitethorn, *Acacia constricta*
Elder, Mexican, *Sambucus mexicana*
Ironwood, *Olneya tesota*
Mesquite, Chilean, *Prosopis chilensis*
Mesquite, Common, *Prosopis juliflora*
Palo Verde, Blue, *Cercidium floridum*
Palo Verde, Little-leaf, *Cercidium microphyllum*
Soapberry, Western, *Sapindus saponaria*
Tamarisk, *Tamarix aphylla* .

10 to 20 feet

Acacia, Sweet, *Acacia farnesiana*
Arizona Rosewood, *Vauquelinia californica*
Featherbush, *Lysiloma thornberi*
Mesquite, Screwbean, *Prosopis pubescens*
Sugarbush, *Rhus ovata*
Texas Mountain Laurel, *Sophora secundiflora*
Salt-Cedar, Tamarix pentandra

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Desert Broom, *Baccharis sarothroides*
Hackberry, Desert, *Celtis pallida*
Indigo-bush, *Dalea wislizeni*
Jojoba, *Simmondsia chinensis*
Salt-bush, Australian, *Atriplex semibaccata*
Salt-bush, Four-wing, *Atriplex canescens*
Quail-brush, *Atriplex lentiformis*
Salt-cedar, *Tamarix pentandra*

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Above Eye-Level

Alligator Juniper, *Juniperus deppeana*
Arizona Rosewood, *Vauquelinia californica*
Cypress, Arizona, *Cupressus arizonica*
Desert Willow, *Chilopsis linearis*
Feather Bush, *Lysiloma thornberi*
Hackberry, Desert, *Celtis pallida*
Sugarbush, *Rhus ovata*
Texas Mountain Laurel, *Sophora secundiflora*

Waist to Eye-Level

Creosote Bush, *Larrea divaricata*
Desert Broom, *Baccharis sarothroides*
Hopbush, *Dodonaea viscosa*
Jojoba, *Simmondsia chiensis*
Manzanita, Point-leaf, *Arctostaphylos pungens*
Quail-brush, *Atriplex lentiformis*
Salt-bush, Four-wing, *Atriplex canescens*
Senna, Shrubby, *Cassia wislizeni*
Texas Ranger, *Leucophyllum frutescens*
Trumpet Bush, Yellow, *Stenolobium stans*

Knee to Waist Level

Brittle bush, *Encelia farinosa*
Fairy Duster, *Calliandra eriophylla*
Indigo-bush, *Dalea wislizeni*
Turpentine-bush, *Aplopapus laricufolius*

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Hummingbird Trumpet, *Zauschneria latifolia*
Indigo-bush, *Dalea wislizeni*
Jojoba, *Simmondsia chinensis*
Salt-bush, Australian, *Atriplex semibaccata*
Salt-bush, Four-wing, *Atriplex canescens*

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Bird-of-Paradise, Yellow, *Caesalpinia gilliesii*
Bird-of-Paradise, Red, *Caesalpinia pulcherrima*
Brittle-bush, *Encelia farinosa*
Coral-bean, Western, *Erythrina flabelliformis*
Desert Willow, *Chilopsis linearis*
Fairy Duster, *Calliandra eriophylla*
Indigo-bush, *Dalea wislizeni*
Ironwood, *Olynea tesota*
Ocotillo, *Fouquieria splendens*
Palo Verde, Blue, *Cercidium floridum*
Senna, Shrubby, *Cassia wislizeni*
Smoketree, *Dalea spinosa*
Texas Mountain Laurel, *Sophora secundiflora*
Texas Ranger, *Leucophyllum frutescens*
Trumpet-bush, Yellow, *Stenolobium stans*

Foliage Texture or Color

Arizona Rosewood, *Vauquelinia californa*
Cypress, Arizona, *Cupressus arizonica*
Holly-Grape, *Berberis trifoliata*
Hopbush, *Dodonaea viscosa*
Jojoba, *Simmondsia chinensis*
Pinyon Pine, *Pinus edulis*
Salt-bush, Holly-leaved, *Atriplex hymenelytra*
Sugarbush, *Rhus ovata*
Texas Ranger, *Leucophyllum frutenscens*

Growth Habit, Distinctive Branching Characteristics

Alligator Juniper, *Juniperus deppeana*
California Fan Palm, *Washingtonia filifera*
Creosote Bush, *Larrea divaricata*
Desert Willow, *Chilopsis linearis*
Ironwood, *Olneya tesota*
Jojoba, *Simmondsia chinensis*
Manzanita, Point-Leaf, *Arctostaphylos pungens*
Ocotillo, *Fouquieria splendens*
Palo Verde, Blue, *Cercidium floridum*

**not native*

ARIZONA NATIVE PLANT LAW

Under Arizona Revised Statutes, Chapter 7, Article 1, the digging of native plants is strictly controlled by law. Excerpts from this law, which is rigidly enforced, are presented here to acquaint you with some of its key provisions:

"Sec. 3-901. Protected group of plants; botanical names govern; power to add or remove plants

A. The botanical names of the plants referred to in this article shall in all cases govern in the interpretation of this article. Protected native plants shall be any plant or part thereof, **except its fruit**, named in the protected group which is growing wild on state land or public land or on privately owned land without being propagated or cultivated by human beings.

B. The following shall constitute certain protected native plants that are prohibited from collection except for scientific or educational purposes under permit from the Arizona Commission of Agriculture and Horticulture: Washingtonia filifera (fan palm), Lysiloma thornberi (ornamental tree), Bursera fagaroides (elephant tree), Cereus schottii (senita or "old one"), Cereus thurberi (organ pipe cactus), Toumeya papyracantha, Toumeya peeblesiana, Neoevansia diguetii (dahlia cactus), Pediocactus paradinei.

C. The following shall constitute the protected group of plants:
   1. All species of the following families: liliaceae (lily family), Amaryllidaceae (amaryllis family), Orchidaceae (orchid family), Crassulaceae (orpine family), Cactaceae (cactus family).
   2. All species of the following genera: Aquilegia (columbine), Lobelia (lobelia), Dodecatheon (shooting star), Primula (primrose), Fouquieria (octotillo).
   3. The following species: Atriplex hymenelytra (desert holly), Cercis occidentalis (western redbud), Dalea spinosa (smoke tree), Holacantha emoryi (crucifixion thorn), Fremontia californica (flannel bush), Pinus aristata (bristlecone pine).

D. The Arizona Commission of Agriculture and Horticulture may, after public hearing, add or remove any native plant to or from the protected group. A public hearing on native plants shall be held at least every twelve months."

Further important provisions of this law are as follows:

1. Application blanks for the possession, taking, digging up or transportation or protected native plants can be obtained by calling the Commission at 271-4373, or writing to 1688 West Adams, Phoenix, Arizona 85007 or at any District offices located in Parker, Yuma, Casa Grande, Tucson, Nogales, Willcox and Safford.
2. The application for a permit is to be made out by the landowner. He signs the document with his name, address, telephone number and legally describes the property owned by him. He also names the person or persons with their address who are receiving permission to possess, take, dig up or transport the plants. The number and kind of plants must also be listed.
3. When the application for permit is completed, it is to be presented at the Commission's main office located at 1688 West Adams, Phoenix, or at a District office, for approval and verification of information listed. If all information is in order, the permit is issued immediately.
4. The Native Plant Law requires that when a permit is issued, all protected native plants listed on that permit must have a native plant tag and seal attached firmly to each plant during possessing, taking, digging up and transporting of said plant or plants. The tags are to remain on the plants until they are planted on the homeowner's grounds. The homeowner keeps the tags in his possession to show that the plants were obtained legally, should an investigator make inquiry. Any plant found in violation of the above will be confiscated.
5. The native plant tags require a fee of $2.00 for each Saguaro cactus and $1.00 each for all other protected native plants. The monies collected are used only for the enforcement of this law, thus protecting and preserving Arizona's natural beauty.
6. All peace officers in Arizona assist the Commission in enforcing provisions of the law. Violations of this law are a misdemeanor and are punishable by a fine of not less than $50.00, or imprisonment not to exceed 90 days, or both. Each plant illegally possessed, dug up, transported, destroyed or mutilated is considered a separate offense.
7. There is no law which prohibits the collecting of seed from native plants. However, all land in Arizona is owned by someone, even if it is not fenced or posted, and any person illegally removing seeds or plants from these lands can face a charge of theft.
8. Copies of the Arizona Native Plant Law or information relating to the law, may be obtained by visiting, writing or calling any Commission office.

"I love thy rocks and rills, thy woods and templed hills—"

As nowhere else in our country, these familiar words which paint so vivid a portrait echo through the majestic mountains, rugged canyons and silent deserts of the great Southwest. Those of us who will recall the first shock waves of awe, then love, we felt for that intangible beauty of our desert home will now discover new ways to invoke it again! We can both capture and preserve that pristine lure through the wise use of native plants, as well as many other natural resources which exist in such fragile balance here. The authors have attempted to lead us into the best of all possible worlds: the beautification of our urban and suburban environment without sacrifice of its treasured natural heritage.

We have only to follow.

—Editor

Native Trees and Shrubs for Landscape Use *in the Desert Southwest*

The natural beauty of the arid southwest, and especially the Sonoran Desert, inspires many people to try to capture or in some way express the unique charm and subtle moods of the desert in man-made landscapes. When these gardens are carefully planned and planted, they provide an outdoor setting of unusual beauty and one that requires little upkeep.

The design of a desert garden follows the same principles that apply to any other kind of landscape. A plan should be prepared based on day-to-day activities and special needs and interests of the family. Physical site characteristics such as topography, exposure to sun and wind, views (both good and bad), and location of utilities should be considered, as well.

Guided by such a plan, the home gardener will discover many functional landscape uses for native trees and shrubs. They can define or enclose space; reduce the heat and glare of the sun; provide privacy or shelter from the wind; control the movement of people, animals or vehicles; and simply add interest and enrichment to outdoor areas. In reality, plants are a kind of *building material* which you can use along with other materials such as paving, walls, fences and overhead shelters to shape outdoor spaces and make them more liveable and pleasant.

A front yard filled with assorted cacti, succulents, and yucca cannot truly be described as a desert landscape. These plants are showy and often spectacular, but because of their bold form they should be used with restraint. They are most effective as dramatic accent plants.

Why landscape with native plants? Besides personal taste, this is often the most sensible treatment for an area you want to keep attractive for the least amount of effort. It is a logical choice when an existing native tree or shrub has such dramatic form or character that it easily becomes the key element around which the rest of the garden can be planned. Finally, plantings of native trees and shrubs can soften the abrupt transition from lush, irrigated areas around the home to the open desert beyond.

Keep it simple. The most successful desert landscapes are simple and uncluttered. Select a few kinds of plants that meet your basic design needs and will grow with the soil, water and care you can provide. Look to the natural landscape for ideas on grouping native plants in interesting and attractive ways.

Avoid the common mistake of casually mixing desert trees and shrubs with luxuriant vegetation that requires rich soils, heavy fertilization and large amounts of water. Such plantings lack aesthetic appeal and are almost impossible to maintain properly. A helpful fact is that plant combinations that seem to be ecologically valid also look well together.

Non-native desert plants. Desert gardens may include certain cacti, aloes, agaves and yuccas as well as trees and shrubs from other arid regions which, although not native to the Sonoran desert, convey much of its feeling and grow with as little care. Some of these non-natives have naturalized or have been used so long by desert gardeners that they now seem to be a part of our desert flora.

The use of rocks and boulders. The kind, size and arrangement of rocks in the desert landscape should suggest natural formations found in the area. Unless placed in relationship to one another as they might appear in a desert wash or canyon, or on a foothills slope or mountainside, rocks and boulders lose much of their landscape effect.

In selecting rocks, avoid unusual colors and bizarre shapes and textures. Plan to use a few large stones for making at least one key feature as well as some secondary rocks of varying sizes, weighing 50 to 150 pounds, to help integrate the big ones into a composition or scene.

It is rarely desirable to place rocks in rows or in set designs or patterns. A lot of small rocks look fussy, especially if they are evenly spaced. A frequent mistake is to surround each tree, shrub or clump of cactus in the landscape with a circle of stones, as if they were the teeth of some giant prehistoric reptile. Eight or ten well-chosen, well-placed boulders produce a much more dramatic effect than hundreds of small rocks scattered about the yard or heaped in a jumbled pile.

Perhaps the most common error in placing boulders in desert landscapes is that of simply dropping them haphazardly on the soil surface. This creates an artificial "hand-placed" effect. A boulder which has its base slightly buried in the soil takes on a more natural appearance and look as though it might be the top edge of an underlying rock outcrop. To heighten this effect, bury some rocks deeper than others. Keep in mind that rocks and boulders look different from various angles, so experiment with their arrangement before digging them in.

Rock mulches make an attractive groundcover in desert landscapes. Choose natural-appearing rock such as "river-run" rather than a crushed or brightly-colored type which is out of character with desert settings. If boulders or large stones are a part of the landscape, use a rock mulch that is of the same geological formation or at least compatible in appearance.

Do not consider rock mulches as a short cut to low maintenance gardening, since weeds often grow better in a mulched area than in bare ground.

*Availability of native plants.** Some of them will be unavailable or difficult to locate in retail nurseries. This is simply the law of supply and demand in action. If interest in native plants becomes great enough, nurserymen will find find it profitable to grow and sell them.

Nursery-grown plants are always preferred to wild plants dug from the open desert because they are much more likely to survive transplanting. Nursery-grown natives sometimes appear to differ from mature plants of the same species in the wild state. Those which are normally evergreen may lose their leaves for a time under nursery cultivation. Unlike many horticultural plants which grow dense and full, even in small nursery containers, young nursery-grown native trees and shrubs tend to be a bit thin and sparse. Don't let this discourage you from using them. They will probably assume their natural form and texture within a year after being placed in the landscape.

Some native cacti, agaves and yuccas are easily transplanted from the desert. This practice is strictly controlled by law. Desert trees and shrubs are almost impossible to move successfully—even as small plants, because most of their deep and extensive roots are lost in transplanting. As a practical alternative, a number of species can be grown quickly and easily from seed.

Transplanting is not a problem, even for hard-to-move types, when they have been produced from seed and grown in a pot or container for a period of time. For example, a shade tree can be developed in as short a time as 3 years from a one-gallon mesquite or palo verde if watered properly. The seeds of many desert trees and shrubs (especially those in the legume family) are covered with a hard, water-impervious seed coat. This tough outer shell protects the delicate embryo within until conditions are favorable for germination.

To activate the germination process, the seeds must be "scarified"; that is, the seed coat must be scratched, cracked or broken to allow water to enter. Unless this is done, the seeds germinate very slowly or not at all.

An ordinary metal file is an excellent tool for cutting through the seed coat. A distinct color change is usually evident once you have filed through the outer shell and down to the seed tissue within. Only a small break at one point in the seed coat is necessary for water entry. Practically any seed that has a hard thick seed coat will germinate faster if scarified. Immersing the seed briefly in hot water (just below boiling temperature) will achieve the same effect.

Tender seedling trees and shrubs often make better growth if lightly-shaded from the hot sun during their first summer. In many suburban and rural areas the young plants must be protected from rabbits and rodents for several years. A sleeve made of chicken-wire fence or hardware cloth 12-18″ tall around the plant or plants is usually adequate. Secure the fence with stakes or a few stones to prevent it being blown or knocked away. Whenever possible, techniques for growing native plants from seed or by other means will be included with the cultural information for each species in the pages that follow.

Effects of desert climate on plant growth. No other arid region in North America offers such a rich diversity of trees, shrubs, cacti and succulents as that found in the desert southwest. Evergreen and deciduous plants grow together here in varied and complex associations. In addition, two large and distinctly different groups of ephemeral (short-lived) plants occur in this region. One group appears during the summer rainy season, the other depends on winter rains to trigger growth.

The frost-free period may be eight to eleven months long, depending on elevation and topographical features. Because the climate is warm and the range of plants so varied, growth and flowering can take place in any month of the year.

Typical late spring and early summer weather in low and mid-elevation locations consists of a succession of bright, clear, sunny days with low humidity and maximum temperatures hovering near 100° F. or higher. Dry spells or 40 to 60 days or more are not exceptional. The combination of high temperatures, low humidity and dry soil forces many native plants into a semi-dormant state or greatly reduces their activity.

Summer rains (the "monsoon" season) begin any time from late June, and last until late August. While the humidity increases, temperatures may drop slightly for a few hours or days during cloudy, rainy weather. Summer rains are typically brief, intense and limited to small areas or along narrow paths. Many native grasses spring up at this time and along with refreshed trees and shrubs, give the desert a lush green appearance. By early September, the rains have usually ended and hot dry weather returns.

A noticeable trend to cooler weather is apparent by late September or early October. Mild sunny days follow and generally last well into winter. Winter rains develop any time from late November and may continue into March. These are typically gentle and prolonged rains, falling over wide areas. A steady warming trend begins in early March and ushers in the spring wildflower season. The many desert shrubs, trees, cacti and succulents bloom from mid-spring through summer depending on species and location.

Soils. Soils in southwest deserts vary considerably, being shallow, coarse and rocky in the foothills and on mountain slopes; coarse and well-drained on the open plains; deep and fine-textured in flood plains and bajadas and nearly pure sand in washes and arroyos.

There is very little organic matter in most native desert soils. Soluble mineral salts may be present in large amounts, partly because there is not enough rain to leach them out of the upper soil layers. A layer of calcium carbonate called 'caliche' is common in some areas, being found at the soil surface or slightly below and varying in depth from a few inches to many feet. This material often forms a cemented soil layer or hard pan so tight that plant roots cannot grow into it.

* The tree and shrub lists offered in this publication are not all-inclusive. However, they present—in the authors' opinions—some of the most useful species.

PLANTING THE NATIVES, NURSERY OR HOME-PROPAGATED

When to plant. Most native plants can survive with little attention once established. However, they require proper planting and early care if they are to succeed. When grown in containers, most trees and shrub species can be planted year-round in the desert. Late summer and early fall (September and October) and spring (March through May) are excellent times to set out many natives because cooler air and soil temperatures reduce heat and water stress. Summer transplanting also gives good results with most cacti, agaves, aloes, palms and yuccas.

Be sure to examine the roots of container stock at planting time. If the plant has grown in the same container too long, its roots develop a distinct spiral pattern especially at the bottom of the soilball. Gently pull these roots apart and straighten them out if they are short enough to handle in this way. If they are so tangled and interwoven that they cannot easily be separated, make two or three vertical slices an inch deep from top to bottom on the sidesof the root ball just before planting.

Soil preparation. In the natural state, native plants grow on a wide range of sites, from sandy washes and fertile canyon riverbeds to steep rocky hillsides. Good soil drainage is the one common characteristic of these locations, and it is an important requirement for native plants in man-made landscapes. Excess water should drain away soon after irrigation in desert gardens. Never allow surface water to stand in a pool around plant stems except for the few hours during irrigation when this may be necessary.

Native trees and shrubs establish more quickly in a new location and make better growth for the first two or three years if a large planting hole is prepared and some form of organic matter is added to the soil. Shredded bark and other wood residue materials are long-lasting but compost or peatmoss can also be used to improve soil seration and drainage. Mix one part organic matter with three or four parts soil in the planting hole.

Manure as a sole additive is not recommended because it may raise the level of soluble salts to the point where sensitive plant roots are injured. This is most likely to occur when it is added in amounts large enough to improve soil structure. Raw, undecomposed sawdust which temporarily ties up soil nitrogen and may contain substances harmful to plant roots is best not used in the soil at planting time. Cacti and similar desert plants require special planting techniques not covered in this publication.

If the planting site consists mostly of rocks, gravel or sand, dig a planting hole large enough to accommodate the root system of the full-grown plant. The same procedure should be followed in caliche areas. Run several inches of water in caliche planting holes to test drainage. If water stands in the bottom of the hole longer than three or four hours, dig a six-inch drainage chimney down into more porous soil.

Fertilizing. A light application of fertilizer 4 to 6 weeks after planting will encourage good growth and color for trees and shrubs set out any time in spring or summer. Trees and shrubs planted in fall or winter can be fertilized in early March. The only nutrient likely to be in short supply is nitrogen. Therefore, any nitrogen-containing fertilizer, organic or inorganic, will be satisfactory if applied in moderation. For example, ammonium sulfate can be used at the rate of 2 tablespoons per plant from a five-gallon container. Most custom lawn and garden fertilizers can be used at the same rate with safety. Plants set out in fall, winter or early spring may be fertilized a second time in mid-July at the same rate. Be very careful not to overfertilize desert plants. This will probably result in plant injury, or, at best, weak, uncharacteristic growth which is easily damaged by wind, temperature extremes, insect pests or diseases.

Watering. Newly planted trees and shrubs need careful, deep watering to encourage strong roots and good growth. The first 4 to 6 weeks are critical for plants set out in spring or summer. Those set out in cool fall or winter weather require less water during the establishment period.

Container grown stock which is produced under ideal nursery conditions sometimes develops top growth which is proportionately larger than the confined root system. Until these plants develop new roots outside the original soilball, extra attention must be given to watering. Such trees and shrubs are not likely to survive, however, if the soil around their roots is kept saturated by frequent, shallow irrigation.

Bare root trees and shrubs must also be watered carefully until they regenerate a system of tiny root hairs for the absorption of soil water and nutrients.

No single watering schedule can be applied to all transplanted trees and shrubs. This is determined by the nature of the soil, the weather and the water requirements of individual plant species. In general transplants should be watered deeply and thoroughly each time there is a need for water. The idea is to build a reserve of soil moisture on which the plant roots can draw for several days.

For the first two or three weeks following transplanting in warm weather, new trees and shrubs may require watering at 2- to 4-day intervals. As new roots develop, plants can draw on a greater volume of soil for moisture and water should be applied deeply but less frequently. Once plants have begun vigorous root growth, a thorough watering once every seven to ten days should be adequate for the first growing season. In very hot weather and on soils that do not retain much water, a twice weekly schedule may be necessary for transplants. Test the soil in the plant root zone for dryness but especially watch for the first early symptoms of wilting to determine if you are meeting the plant's water needs.

Take special care to avoid overwatering. Soil which is constantly waterlogged lacks the oxygen needed by living plant roots and encourages serious root diseases. Few of the plants described in this publication will endure promiscuous watering which leaves the soil soggy and wet for days.

Pruning. Light pruning and pinching back throughout the first growing season can help determine the eventual shape and character of the mature plant. Also, pinching back undesirable shoots to 4 to 6 inches in length encourages maximum growth of desirable stems without wasting the plant's growth potential. This is especially important with trees. Some tree species such as mesquite develop limber branches that may require staking for a time. Select strong wide-angled branches that are well spaced around the trunk for the permanent tree framework. Ideally, these branches should be 6 inches or more apart vertically on the main stem.

Native shrubs can be made more dense and compact by cutting back extra-long branches. If an open tracery of branches is desired, thin out the interior of the shrub, saving branches that have the most interesting line and character.

CARE OF ESTABLISHED PLANTS

Watering. Once established, trees and shrubs which are native to the warmest, driest desert areas can often survive and grow without supplemental irrigation. This group includes White Thorn Acacia, Palo Verde, Ironwood, Desert Broom, Creosote Bush and Fairy Duster. However, two or more deep irrigations during the period from April through September will greatly improve their growth rate, foliage color and flowering effects. If time is important and the objective is to produce vigorous growth and a mature landscape, these plants may be watered every 1 to 4 weeks during the growing season. Established trees and shrubs seldom need irrigation during the winter months except in prolonged droughts. Excess soil moisture during winter can cause the loss of many plants in desert gardens. If the winter is exceptionally dry, one or two slow, deep applications of water will be adequate.

A second group of native plants, those found in moister situations or at elevations just above the desert, depend on regular watering to survive in the hot summer areas of low and intermediate desert valleys. Such plants as Manzanita, Red and Yellow Bird of Paradise, Sugarbush, Yellow Trumpet Bush and Arizona Rosewood should be watered every 2 to 4 weeks during the growing season depending on weather and soil characteristics. Pines, junipers, oaks and cypress, and water course trees like sycamore, cottonwood and ash may require even more frequent irrigation.

Always irrigate deeply to satisfy plant needs and to leach harmful salts down and out of the root zone. If an irrigation basin is to be used, make it several inches deep and at least as wide as the spread of the branches. At irrigation time, first fill the basin with water, then run a garden hose just fast enough to maintain this level for two to four hours, depending on the size of the plant.

Fertilizing. The supply of plant nutrients in southwest desert soils is generally adequate to meet the needs of native trees and shrubs. However, many plants respond to increased soil fertility with more vigorous growth and better foliage color. Nitrogen is usually the key fertilizer element. Only occasional phosphate and no potash treatment need be made. Iron chlorosis is a problem that can be readily corrected by an application of iron chelate.

Trees and shrubs will respond to almost any commercial nitrogen-containing fertilizer. Ammonium sulfate can be applied at the rate of 5 pounds (5 pint-jars-full) per 1000 square feet of landscape area. Use custom lawn and garden fertilizers at the package rate recommended for trees and shrubs. Spread the material evenly on the soil surface from near the base of the trunk out slightly beyond the spread of the branches. After applying the fertilizer, irrigate thoroughly to move it down into the root zone soil. One application in February is usually sufficient. If plants show a need for it, a second application may be made in July.

Pruning. The natural growth habit of native plants is generally far more attractive than anything man may impose on them by pruning. Therefore, the basic goal of pruning should be to reveal and better display the beauty of the natural plant form. This usually involves little more than routine removal of off-balanced growth, crossing or interfering branches and dead or diseased twigs. When a home is built in existing native vegetation, it may be desirable to remove a few of the lowest branches on certain trees and large shrubs to bring out the beauty of the trunk or trunks and main branch framework. This pruning should not drastically change the shape or height of the plant, but simply accent or emphasize its natural character. Certain trees, like mesquites and palo verdes, can be trained into shade trees by gradual removal of lower side branches and generous watering.

PLANT CLIMATE ZONES

This publication is intended to serve as a guide to the landscape use of native trees and shrubs in the southern half of Arizona, southeast California, and northern Sonora in Mexico—ranging from below sea level (Imperial Valley) to 5000 feet above sea level. Of course, not all native plants will grow throughout this region because of wide variations in climate.

In the following plant descriptions, three climate zones are used to give some idea of species adaptation based on cold hardiness. Note that the point-of-reference communities in each zone have been grouped into two subzones. Communities in the upper sub-zone have a somewhat cooler climate. Plants considered marginal for the zone seldom survive here except in very protected locations. Communities in the lower sub-zone often have a milder climate which makes it possible to grow the marginal plants with reasonable success. Remember too, that these climate zones grade into one another near their boundaries, with a corresponding effect on plant-performance.

Experienced desert gardeners know that *microclimate* effects (elevation, exposure, air drainage, heat radiation from buildings and paving, etc.) can create a significantly cooler or warmer environment for plants. The *microclimates* found within your own landscape may determine whether or not you can grow a given tree or shrub in a particular location.

Zone 3: HIGH ALTITUDE DESERT

Representative Cities

ARIZONA	MEXICO	CALIFORNIA
Benson	Cananea	Barstow
Bisbee		California City
Clifton		Hesperia
Douglas		Lancaster
Globe		Mohave
Kingman		Palmdale
Natural Bridge		Victorville
Nogales		Yucca Valley
Sedona		
Tombstone		

Zone 4: MID-ALTITUDE DESERT

Representative Cities

ARIZONA	CALIFORNIA
Ajo	Desert Center
Safford	Twentynine Palms
Tucson	
Wickenburg	

Zone 5: LOW ALTITUDE DESERT

Representative Cities

ARIZONA	MEXICO	CALIFORNIA
Buckeye	Kino Bay	Blythe
Casa Grande	Puerto Penasco	Borrego
Chandler	Hermosillo	Brawley
Florence	Guaymas	Desert Hot Springs
Gila Bend		El Centro
Parker		Indio
Phoenix		Needles
Yuma		Palm Springs
		Thermal

Microclimates. South and west-facing banks and slopes absorb more of the sun's radiant energy during the day and are warmer than north and east slopes. This is important to cold-tender plants and those that grow best on hot, sunny sites. Thermal belts are localized warm microclimates that develop on sloping land above valleys and other lowlands. Winters are distinctly cooler both below and above these bands of mild temperatures. If your garden is in a warm thermal belt you will probably be able to grow a number of plants considered too cold-tender for the general area.

Buildings, automobiles, large expanses of concrete and other heat-absorbing surfaces all contribute toward making cities and towns warmer than outlying areas. The warmest areas in the home landscape are usually beside paved surfaces such as sidewalks, driveways, patios and sunny south and west walls and fences. Besides reflecting some of the sun's heat, light and glare, these surfaces store heat during daylight hours, then radiate it back into the atmosphere at night. Dark surfaces absorb appreciably more heat than light-colored ones.

Topography and air drainage are an important aspect of microclimate and help determine how well certain plants grow in your landscape. As the air next to ground surfaces cools at night, it becomes heavier. Like water, it flows slowly downhill into washes, valleys or cold air basins, filling depressions and low spots as it progresses. Landscapes in mountain foothills or near the top of slopes and ridges often escape severe frosts because the coldest air settles in low areas at night. On the other hand, a garden located in a valley or other depression will probably be exposed to colder temperatures than average for the area.

Structural walls, plant hedges and screens can act as a dam which traps this cold air on the uphill side creating a frost pocket. However, they provide shelter and protection if arranged so as to deflect the downhill flow of cold air around gardens and outdoor living areas.

Each side of a building has its own microclimate which strongly influences plant growth. The cool, shaded north side is best for cold-tolerant plants and those that do not grow well in full sunlight. A wall that faces south receives maximum sunlight throughout the year. To succeed here, plants must tolerate intense heat and brilliant sunlight. Both east and west-facing walls are exposed to a half a day of sun, but high afternoon temperatures create a much hotter microclimate against the west side.

Roof overhangs provide a sheltering effect and offer extra cold protection to plants growing beneath them. At night, heat radiated out by the building wall and the soil at its base are retained, creating a warmer microclimate in the space below the overhang.

The spreading leafy canopy of a tree or vine-covered arbor creates an oasis of shade during the day, but after sundown it acts as a ceiling which traps heat radiated up from ground surfaces. This gives a few critical degrees of frost protection to plants growing beneath them.

Wind is a potential problem in the garden microclimate. It tends to dry out tender foliage or even blow over trees and shrubs. Nearly every landscape has its windy corners as well as quiet spots sheltered from strong air currents. A wind funnel may form when air currents are forced between two buildings or rows of close-spaced buildings as in some residential subdivisions. Select tough, wind-resistant plant species or develop some sort of wind protection for such locations.

Definitions of Landscape Terms*

Shrub border, hedge or space definer: A group of shrubs or small trees used as a boundary for defining property lines or spaces within the property. May be allowed to grow naturally or pruned to a formal shape.

Accent: A plant with striking form or color which draws the attention of the viewer and emphasizes that portion of the landscape or creates a center of interest.

Facer: Low spreading shrubs used to relate a structure to the site. Often a foundation plant. Also a softening device or shrub placed in the foreground of taller plants.

Barrier: Shrubs or small dense trees used to provide privacy, control or block pedestrian or vehicular traffic, headlight glare, or climate conditions such as wind or drifting sand.

Background: Tall shrubs or trees which create a foil or setting for a structure, garden or other plantings. Often these are strong dense plants which do not especially draw attention to themselves.

Specimen: Very special well-developed plants of nearly mature form which stand out as individuals for dramatic qualities in the landscape. Although not attracting as much interest, these can be used as "accent" plants.

Groundcover: Plants of varying heights to cover large areas. The size and scale of the plants depends on the needs of the design. The term generally implies plants being used to carpet a space.

Espalier or Wall Plant: Plant trained to grow on a vertical surface. Most effective when the plant's growth habit lends itself to training in attractive patterns on blank wall spaces or fences. Purpose is to create interest and in some cases to display attractive flowers or fruit.

Skyline Tree: Tall tree which creates an interesting branch pattern against the sky, especially when the sun is low.

Patio Tree: Small-scale tree, usually of umbrella form, for limited or small spaces.

Color Plant: Plant which provides a spectacular color display of flowers, fruit, leaves or stems. Usually a seasonal
occurrence which may be brief and intense or less showy but extending over a longer period.

Desert Effects Plant: Any plant having dramatic form which evokes a special quality of the desert or is symbolic of the desert landscape.

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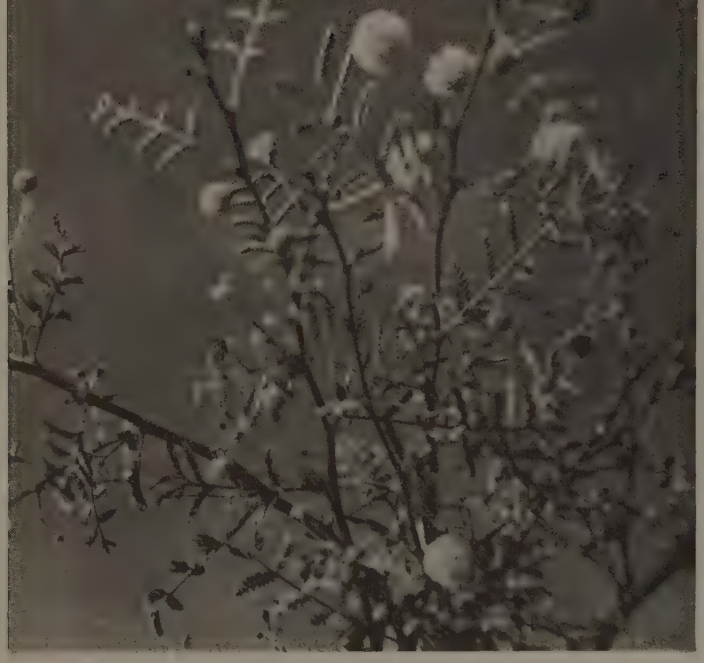
*These plant lists do not include such desert natives as the cacti, yuccas, agaves, desert spoon, bear grass and others. These plants, which are more for accent and dramatic effect, are a subject in themselves and will be discussed in a later publication.

Foothills palo verde

Trees

(This category includes many plants which mature as small trees or large shrubs depending on soil, moisture and climate as well as training and pruning given by the gardener.)



White-thorn (Mescat acacia)

Acacia constricta

Height: 10–15 feet **Spread:** to 15 feet

Hardiness zones: 3, 4, 5

Description: A large shrub or small multiple-trunked tree common along streams and washes and on dry desert slopes and mesas from 2500 to 5000 feet. The fern-like green foilage appears in mid-spring, except following a dry winter when the plant may remain leafless until the onset of summer rains. Masses of fragrant, yellow, ball-shaped flower clusters decorate the branches in late spring and intermittently thereafter until early fall. Long slender white thorns which develop on some of the twigs discourage too much familiarity with this small tree.

Landscape value: Screen, background for other plantings, large informal hedge or barrier plant, small patio tree.

Maintenance requirements and propagation: Grows well under adverse conditions, tolerating heat, drought and poor soil once established. Easily propagated from seed, but best grown for a time in a container, before planting in open ground.

Sweet acacia (Huisache)

Acacia farnesiana

Height: 10–20 feet **Spread:** to 20 feet

Hardiness zones: 5, warm microclimates in 4

Description: Small, wide-spreading evergreen-to-deciduous tree or large shrub having delicate, lace-like foliage and spiny twigs. The tiny, fragrant, yellow-orange flowers are arranged in fluffy balls like miniature pincushions. This tree is rare in Arizona desert grasslands, canyons and lower oak woodlands from 2500 to 4000 feet.It is more common in Mexico and other warm regions of the world. Bloom period and hardiness vary with region of origin.

Landscape value: Striking landscape specimen or an accent plant, patio tree, hedge, wide-spreading screen or as a space divider. Breath-taking floral display appears anytime from mid-November to February or March. Adds fragrance to the garden.

Maintenance requirements and propagation: Tolerates heat, drought and alkaline soils. Fast growing on deep soils supplied with adequate water. There is considerable variation in cold tolerance among seedlings, but Sweet Acacia is considered hardy to about 16–18° F. Lower temperatures result in branch die-back, but recovery is fairly rapid the following spring. This acacia can be grown from seed, but it is generally sold as a container plant at retail nurseries.

Catclaw acacia

Acacia greggii

Height: 20 feet **Spread:** 20 feet

Hardiness zones: 3, 4, 5

Description: The sharp claw-like spines which arm twigs and branches of this shrubby tree give it its common name. Catclaw is somewhat more open and rangy than white-thorn, with fine-textured grey-green foliage that persists until killed by heavy frost in autumn. The branches are studded with fragrant, pale yellow tassel-like flower clusters in April and May. Found mostly along streamways and washes and in canyons to 5000 feet. Grows larger and assumes a more tree-like form on deep soils. Landscape value and culture are similar to white-thorn. Do not use where passers-by will be scratched by brushing against thorny stems or branches.

Netleaf hackberry (Palo blanco)

Celtis reticulata

Height: 10–40 feet **Spread:** 10–40 feet

Hardiness zones: 3, 4, 5

Description: A handsome deciduous tree whose canopy of thick green leaves casts dense summer shade. Small green flowers are borne in great numbers but have no landscape value. The crop of tiny, hard red berries which follow are relished by many birds. This is a common tree along streams and in canyons as well as in desert grasslands and oak woodlands from 2500 to 6000 feet.

Landscape value: Spreading medium-sized shade tree valuable for home yard, street or park use. The gnarled, undulating branches and unusual corky bark provide landscape interest even when the tree is leafless.*

Maintenance requirements and propagation: Fairly tolerant of drought and poor soils, but grows faster and better on deep soils with adequate moisture. Performs well under lawn culture. Foliage tends to scorch in hot summer weather at low desert elevations.

*Seems out of character with many desert plants.

Blue palo verde

Cercidium floridum

Height: 15–30 feet **Spread:** 15–30 feet

Hardiness zones: 4, 5, warm microclimates in 3

Description: Small, spreading desert tree of distinction with smooth blue-green bark and spiny twigs. Much admired for the fragrant masses of yellow flowers that overlay the tree with a golden mantle in April. The dainty blue-green foliage is short-lived unless the tree is watered. In the wild state blue palo verde grows where soil moisture is most abundant as along drainageways, stream beds and washes, and in flood plains, valleys and lowest deserts to 4000 ft.

Landscape value: Picturesque and colorful small shade tree. A choice specimen, accent or color plant for desert effects. Leaf and flower litter limits the use of all palo verdes near swimming pools.

Maintenance requirements and propagation: Drought resistant, but slow growing if entirely dependent on rainfall for water needs. Water deeply on a regular basis during the growing season to encourage faster growth and spectacular flower displays. Blue palo verde is available in a variety of sizes from retail nurseries. Seed germinates readily once the hard, impervious seed coat is penetrated to allow water to enter. This can be done quickly and easily by a few strokes with an ordinary file.

Foothills palo verde (Little-leaf palo verde)

Cercidium microphyllum

Height: 6–20 feet **Spread:** 6–20 feet

Hardiness zones: 4, 5, warm microclimates in 3

Description: A short trunk, smooth yellow-green bark and a dense crown of spiny twigs characterize this palo verde. It is the most abundant of desert trees in southern Arizona, typically associated with Saguaro on dry rocky hillsides and mesas from 500 to 4000 feet. It is also found to a lesser extent in California deserts. Since the tiny yellow-green leaflets apper only briefly following rainfall, the tree is essentially leafless most of the year. Dainty pale yellow flowers open in May, later than the Blue palo verde and not as showy. However, they can transform the desert into a vast sea of yellow by sheer numbers following a wet winter.

Landscape value: Useful for background or screening and as a small patio tree.

Maintenance requirements and propagation: Remarkable ability to withstand heat, drought, caliche and poor soil, but very slow to develop under these conditions. Water regularly in summer to increase growth rate. Some twig and branch die-back may be expected during prolonged drought.* Grows readily from seed planted in summer.

*During these periods an occasional deep irrigation may be in order even for native plants.

Arizona cypress

Cupressus arizonica

Height: 30–40 feet **Spread:** 10–20 feet

Hardiness zones: 3, 4, 5

Description: Dense, pyramidal-to-rounded evergreen, fast-growing on favorable sites. The light green to silvery blue foliage is small and scale-like, giving the tree a fine-textured appearance. On young branches and stems the bark may flake off to reveal attractive cherry red inner bark. Grows singly or in small groves in canyons and on mountainsides from 3000 to 7000 feet.

Landscape value: Dense screen or windbreak, barrier, specimen or accent plant. Seedlings are variable in color, form, and growth rate. Therefore, nursery-grafted cultivars such as 'compacta' and 'pyramidalis' should be used where uniformity among plants is important.

Maintenance requirements and propagation: This tough needleleaf evergreen plant survives neglect but requires deep watering at regular intervals to look its best. * Tends to grow rather open and unkempt at low desert elevations and is not the wisest choice for these locations.

Desert willow

Chilopsis linearis

Height: 10–25 feet **Spread:** 10–15 feet

Hardiness zones: 3, 4, 5

Description: A graceful deciduous shrub or small tree which grows along washes and drainages in mesas, foothills and desert grasslands from 1500 to 5000 feet. The open and spreading growth habit, combined with a delicate tracery of slender twigs and long narrow leaves, make a pleasing textural contrast with other desert vegetation. Showy, trumpet-shaped whitepink or purple flowers appear in greatest numbers in spring followed by a scattering of bloom into late summer if soil moisture is adequate. Trees from higher elevations such as northern Arizona and New Mexico consistently display a deep purple flower color. Plants from seed of northern trees are generally true to type for this characteristic.

Landscape value: Willowy small tree with an interesting gnarled trunk. Effective as an airy accent or specimen or a loose, open background or boundary plant. Very attractive when planted in groups for a grove effect. The delightful floral display reaches a peak in spring but continues through summer under good growing conditions.

Maintenance requirements and propagation: Adapted to a wide range of soils. An occasional deep irrigation results in better flowering and a much larger plant. Older trees may lose their symmetry and look untidy so some clean-up pruning may be required. Grows from seed or easy from cuttings taken in June. Seedling plants are mostly white or pale pink flowering types unless from a northern source. Propagation by cuttings permits selection of deeper, more intense flower colors.

Plants can survive long periods of drought but when stressed for water they often show extensive die-back of the tip growth due to infestations of cypress bark beetle.

Arizona ash

Fraxinus velutina

Height: 40 feet **Spread:** 30–40 feet

Hardiness zones, 3, 4, 5

Description: Medium-to-large-sized deciduous tree with spreading, rounded crown. Occurs along streamways and washes, in canyons, oak woodlands and pine forests from 2000 to 7000 feet.

Landscape value: Useful shade tree for home grounds, street or park planting. Develops a sturdy trunk and branch structure. Foliage turns attractive shades of yellow in autumn. Not compatible in terms of its general appearance, with many desert plants.

Maintenance requirements and propagation: Tolerates poor alkaline soils and some neglect but develops into a much better shade tree when planted in good soil and watered deeply on a regular basis. Will tolerate a lawn situation.

Arizona black walnut

Juglans major

Height: 30–50 feet **Spread:** 50 feet

Hardiness zones: 3, 4, 5

Description: Wide-spreading deciduous tree found mostly along streams and in canyons of upper desert and oak woodlands 2500 to 7000 feet. The coarse yellowish-green foliage is late-appearing in spring. Small, hard-shelled, edible walnuts ripen in fall but are scarcely worth the effort to crack and clean.

Landscape value: A fine artistic shade tree where there is space for its open, wide-spreading crown. Does not combine well with many desert plants and seems to be more at home in a woodsy grove situation as might be found at intermediate and higher elevations. In some landscapes the nuts may create a litter problem under the tree, as do the leaves which drop intermittently from mid-summer on.

Maintenance requirements and propagation: Best growth on deep soils where adequate moisture is available. Wild trees are virtually impossible to transplant beyond the seedling stage because of the deep tap root. Best grown from seed in a container before planting in open ground.

Feather bush (Lysiloma)

Lysiloma thornberi

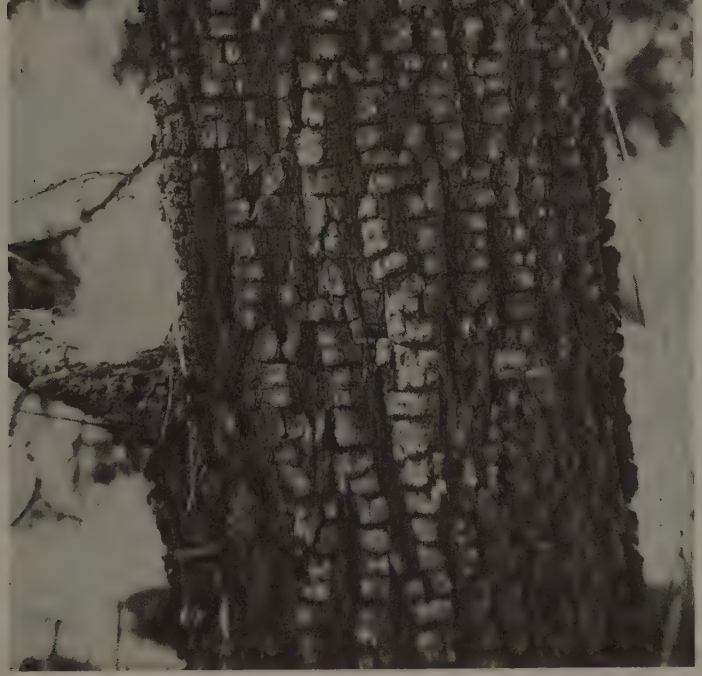
Height: to 15 feet **Spread:** 10–15 feet

Hardiness zones: 5, warm microclimates in 4, a perennial in 3

Description: Fine-textured foliage and a framework of slender branches give this small, spreading tree an appealing feathery appearance. Mature trees develop attractive rough brown bark. It is evergreen in mild areas but goes deciduous for a short time or dies back to the ground each year where hard frosts occur. Creamy white ball-shaped flower clusters ⅝″ in diameter decorate the branches in May or June. These are followed by long brown seed pods in late summer and fall. Lysiloma is rare in the southwest found only in Arizona near its southern border on rocky ledges and hillsides from 2800 to 4000 feet. It is a common plant in the state of Sonora Mexico.

Landscape value: Exceptionally delicate and graceful background shrub, small patio tree or transitional plant between desert and non-desert landscapes. Its lush qualities are especially effective in a desert oasis setting. It is known as the Fern of the Desert.

Maintenance requirements and propagation: Tolerant of desert heat and drought but subject to die-back when winter temperatures fall below 25 degrees F. Uusually recovers quickly in spring. Remove cold-damaged wood after growth resumes in April or May. To develop a tree, water deeply and regularly. Select 1 to 3 vigorous shoots (depending on whether you want a single- or multiple-trunked tree) and stake these upright. Gradually remove lower side branches as the top develops. Widely available as a nursery-grown container plant. Also grows readily from seed.



Alligator juniper

Juniperus deppeana

Height: 20–40 feet **Spread:** 15–30 feet

Hardiness zones: 3, 4, 5

Description: A large, rounded green to blue-green juniper which grows in oak and pinyon-juniper woodlands, and lower reaches of ponderosa pine forests from 4500 to 8000 feet. Often found at much lower elevations on the north slopes of desert mountains. The thick rough bark is divided into 1- to 2-inch plates with deep furrows between.

Landscape value: The southwest's largest native juniper, effective as specimen, accent or screening plant. The distinctive "alligator skin" bark of this long-lived juniper provides considerable landscape interest. Old specimens assume rugged, picturesque shapes. There are silvery-grey foliage types.

Maintenance requirements and propagation: This is a slow-growing juniper and young plants must be watered regularly if they are to develop in a reasonable length of time. Occasional deep irrigation of established plants is necessary in low desert situations and advisable at higher elevations during prolonged droughts. Prune to develop a dense mass of foliage when used as a hedge or screen.

Ironwood (Tesota, Palo-de-Hierro)

Olneya tesota

Height: to 30 feet **Spread:** 20–30 feet

Hardiness zones: 5, warm microclimates in 4

Description: Handsome, slow-growing, rounded tree with one to several short trunks and spiny branches. The dense grey-green foliage persists year-round unless lost as a result of severe winter frosts or drought. Violet pea-like flowers appear in showy clusters May-June. Ironwood grows in washes and on plains from near sea level to slightly below 2500 feet.

Landscape value: Medium sized desert evergreen which at a distance resembles the olive tree in structure. Useful for shade, specimen or accent. Can also serve as a large hedge or barrier planting.

Maintenance requirements and propagation: Ironwood and citrus are similar in their sensitivity to low temperatures. Either can usually be grown where the other is adapted. Provide for a good soil drainage and water regularly to help offset very slow rate of growth.

Mexican palo verde (Jerusalem thorn)

Parkinsonia aculeata

Height: 20–40 feet **Spread:** 20–40 feet

Hardiness zones: 4, 5 warm microclimates in 3

Description: An airy, graceful tree whose crown consists of slender zig-zag twigs and long, drooping leaf blades sparsely covered with tiny leaflets. The foliage is short-lived under dry conditions, and wild trees are leafless most of the year. The leaf midribs remain attached however, appearing like long silky needles. Under extreme drought or cold stress these also drop. Loose clusters of golden yellow flowers make a striking display in late spring and are followed by slender beanpods 2 to 6 inches long. Smooth yellow-green bark is another feature of this tree which is rare north of the American-Mexican border in desert foothills and sandy washes from 2000 to 3000 feet. Mexican palo verde has also naturalized around many cities in the desert southwest.

Landscape value: A delicate, graceful desert tree which provides light, filtered shade and makes a handsome accent or specimen plant. Foliage midrib creates almost constant litter, clogs drains on flat-roofed houses, and stains metal automobile surfaces. This littering is not a problem in lawn areas and, where desired, may serve as a fine needle-like mulch over the soil surface.

Maintenance requirements and propagation: Survives drought, heat and poor soils but often lost as a young tree as a result of palo verde root borer attack. This species is somewhat more sensitive to cold than other palo verdes, and young trees may be injured by low winter temperatures in Zones 3 and 4. Choose a planting site with good soil and give an occasional deep irrigation during the growing season to achieve rapid luxuriant growth and persistent foliage. May be grown under lawn conditions and even tolerates wet soils if they are well drained. Available from many nurseries as a container plant and easily grown from seed which should be scarified before planting. Develops so rapidly from seed it is often planted directly in a permanent location. Early summer is the best time to plant seed.

Pinyon pine

Pinus edulis

Height: 15–35 ft. **Spread:** 10–20 ft.

Hardiness zones: 3, 4, 5

Description: A small, compact pine with stiff yellow-green needles and 1- to 2-inch egg-shaped cones bearing edible seeds (pinyon or pine nuts). Young trees are often conical or rounded in form. At maturity trees tend to be rounded or flat-topped and spreading. Commonly found in pinyon-juniper woodlands from 4000 to 7000 feet.

Landscape value: Accent or specimen plant. A good transitional evergreen in an arid setting.

Maintenance requirements and propagation: This slow-growing pine tolerates some drought and poor, rocky soil but is not adapted to alkaline conditions. Deep irrigation is essential for trees planted in hot desert locations. Young trees should be staked at planting time to ensure symmetrical growth if this is the desired landscape effect.

Arizona sycamore

Platanus wrightii

Height: 40–80 feet **Spread:** to 80 feet

Hardiness zones: 3, 4, 5

Description: A large, deciduous tree with wide-spreading, heavy branches and light-green, maple-like leaves. The thin white bark on the upper trunk and branches peels off in brownish flakes, creating a pleasing mottled effect. This is a common tree along streams and in canyons, desert grasslands and oak woodlands from 2000 to 6000 feet. Clusters of 2 to 4 brown, ball-shaped fruits hang on the branches through winter.

Landscape value: A rugged tree of striking individuality noted for its picturesque form and branching habit. Dramatic skyline, specimen or large shade tree. Grows much too large for small-scale urban and suburban properties. In autumn the foliage takes on attractive bronzy tints, and in winter the mottled bark provides landscape interest. Not a suitable tree for most desert landscape situations.

Maintenance requirements and propagation: Tolerates extremes of heat and cold, but needs regular, deep watering in most desert locations. Does not grow to full size in caliche areas. Well adapted to lawn culture but sometimes develops iron chlorosis. Apply iron chelate to correct the problem.

Fremont cottonwood

Populus fremontii

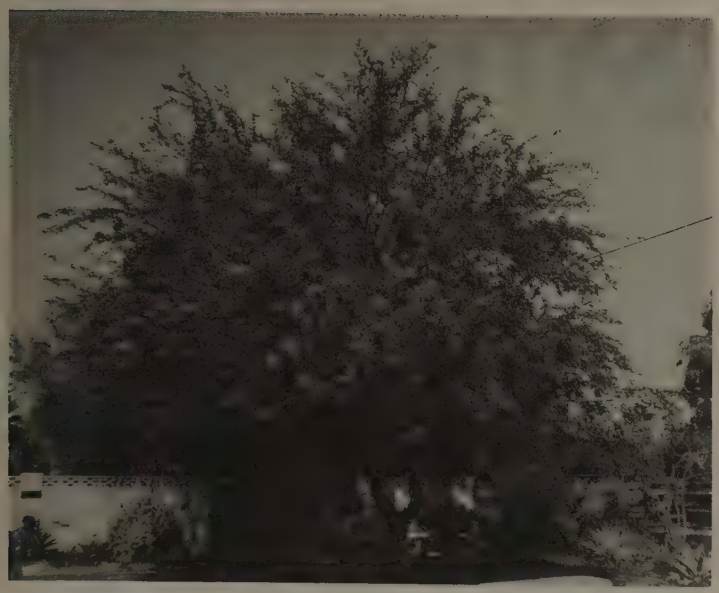
Height: 50–100 feet **Spread:** 40–60 feet

Hardiness zones: 3, 4, 5

Description: Large, fast-growing deciduous tree with a flat-topped, open crown of heavy branches. Mature specimens have trunks covered with thick furrowed bark. The Fremont cottonwood is common along live streams, high-water table areas in deserts and arid grasslands from near sea level to 6000 feet.

Landscape value: This tree, symbolic of many of the settlements in the southwest desert, provides a welcomed feeling of refreshment in arid setting. The shiny light-green leaves shimmer in the slightest breeze creating a unique landscape effect. In autumn or winter, depending on elevation, the foliage turns rich shades of yellow and old gold. Large skyline or shade tree.

Maintenance requirements and propagation: Grows rapidly and luxuriantly in fertile soils with abundant moisture. The roots are very invasive, making it difficult to grow flowers, vegetables and other plants in the immediate vicinity of the tree. Cottonwood roots will also lift sidewalks and street paving and clog waterpipes and sewers. Male and female flowers are borne on separate trees. Plant male trees; avoid bothersome "cotton" produced by female trees.



Chilean mesquite

Prosopis chilensis

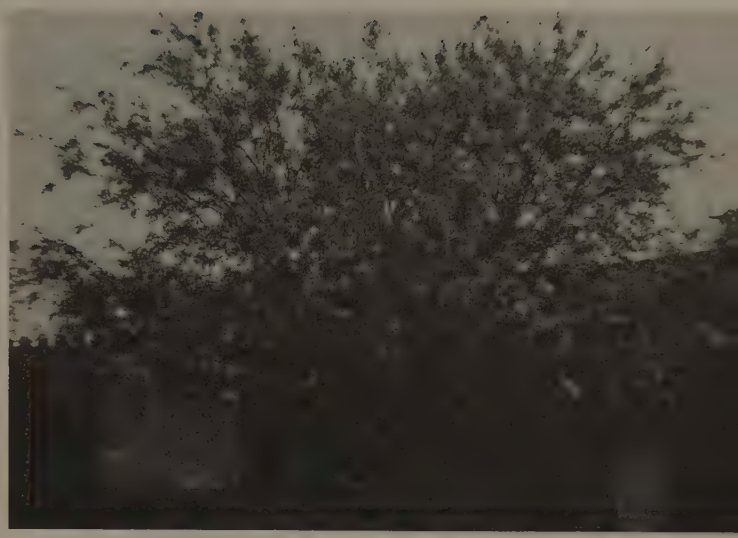
Height: 15–30 feet **Spread:** to 40 feet

Hardiness zones: 3, 4, 5

Description: This is not a native mesquite, but it is commonly planted in southwest deserts because of its superior landscape qualities. Chilean mesquite is symmetrical and fast-growing with bright green, fine-textured foliage that remains on the tree longer in autumn than native mesquites. Often, it will be completely evergreen in the low desert; sometimes thornless.

Landscape value: Small to medium sized shade tree for yard or patio, accent, specimen, screen, windbreak or barrier plant.

Maintenance requirements and propagation: Adaptability same as native mesquites. Deep soil and regular watering greatly improve tree growth and appearance. This fast-growing, often multiple-stemmed young tree may be staked upright to develop height and permanent framework more rapidly. Lateral branches along the lower trunk should be nipped back to 4 to 6 inches in length to encourage growth of the permanent branch structure above head height. Remove shortened lateral branches entirely after the trunk and permanent branch framework have grown sufficiently sturdy.



Common mesquite

Prosopis juliflora

Height: 15–30 feet **Spread:** to 40 feet

Hardiness zones: 3, 4, 5

Description: Small to medium sized tree, a common and characteristic inhabitant of desert streambeds and washes, valleys and grasslands from near sea level to 5000 feet. Typically develops a loose spreading crown of spiny twigs and fern-like foliage on a short trunk. This mesquite has dull, gray-green leaves in contrast to the bright green foliage of Chilean mesquite. Drooping creamy white flower tassels 2 to 3 inches long enhance the lazy appearance of this tree in mid spring. Bean pods, which ripen in fall, may create a litter problem.

Landscape value: Shade tree, accent or specimen, screen, windbreak or barrier plant. The gnarled, twisted trunk and branch structure make it very useful for landscape effects.

Maintenance requirements and propagation: Although tolerant of heat and drought, mesquite grows very slowly under natural conditions. Deep regular irrigation promotes better growth and in good soil eventually results in a large tree. This native adapts well to lawn conditions. Responds well to staking, training and pruning practices suggested for Chilean mesquite.

Screwbean mesquite (Tornillo)

Prosopis pubescens

Height: to 20 feet **Spread:** 10–20 feet

Hardiness zones: 3, 4, 5

Description: Large bush or small, multi-trunked tree with greyish spiny twigs and fine lacy foliage. The common name of this plant derives from the 1-1½-inch-long beanpods that are tightly coiled in the form of a large spiral curl. It is common in flood plains and valleys and along streams to 4000 feet.

Landscape value: Windbreak or screen, small shade tree.

Maintenance requirements and propagation: A tough, hardy native requiring no special care. This species does not grow as large as the two preceding mesquites, even when planted in well-prepared soil and watered adequately. However the same training and pruning procedures can be followed to develop a tree form.

Arizona white oak

Quercus arizonica

Height: 30–60 feet **Spread:** 30–50 feet

Hardiness zones: 3, 4, 5

Description: Irregular, spreading evergreen oak with short branches and thick leathery leaves 1-3 inches long, dull blue-green above and paler beneath. Grows in oak woodlands, canyons and desert mountain foothills to 7500 feet.

Landscape value: Medium-sized evergreen shade or background tree which takes on unusual and picturesque shapes.

Maintenance requirements and propagation: Water deeply on a regular basis in hot desert locations. Very slow to start, but seems to grow faster under garden conditions after the first year or so. May be more sensitive to alkaline soil conditions than other oaks described in this publication. Can be grown from acorns and stored in the refrigerator for several weeks before planting in a mixture of soil and oak leaf humus.

Mexican blue oak

Quercus oblongifolia

Height: 15–25 feet **Spread:** 15–25 feet

Hardiness zones: 3, 4, 5

Description: Evergreen oak found in woodlands and desert mountain foothills 4500 to 6000 feet. Distinctive blue-green leaves which are paler beneath, produce a dense rounded foliage mass.

Landscape value: Attractive small shade tree with unique bluish foliage. Not widely-grown but a very promising native oak for landscape use.

Maintenance requirements and propagation: Culture same as preceding oaks. Deep regular watering necessary when used in the low desert.

Emory oak (Bellota)

Quercus emoryi

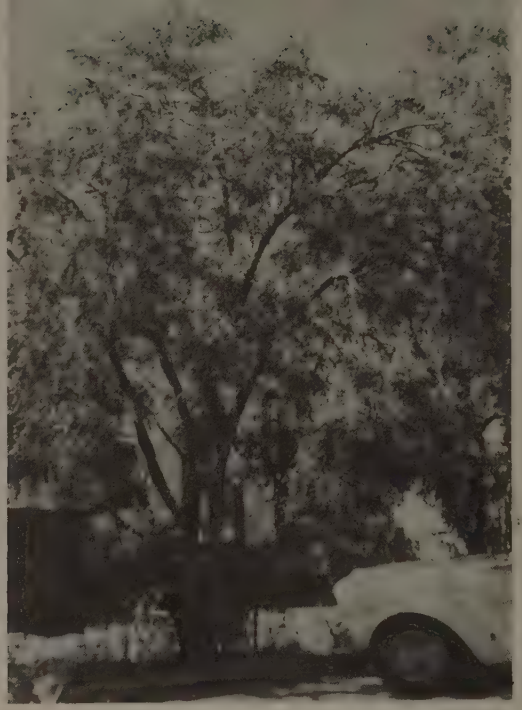
Height: 50 feet **Spread:** 40–60 feet

Hardiness zones: 3, 4, 5

Description: A slow growing, wide spreading evergreen oak, common in foothills and canyons 3000 to 8000 feet. The shiny 1- to 1½-inch-long leathery leaves turn bronzy gold each spring just before being replaced by new foliage.

Landscape value: Handsome compact shade or background tree for more spacious landscapes. Slow to reach a useful size, but the eventual landscape effect of this oak is well worth the wait.

Maintenance requirements and propagation: Deep regular watering required in warm desert regions. Propagate from acorns as described for Arizona white oak. Growth rate increases significantly under good garden conditions.



Mexican elder

Sambucus mexicana

Height: 20–30 feet **Spread:** 15–25 feet

Hardiness zones: 3, 4, 5

Description: Semi-evergreen tree commonly found along streams and ditch banks from 1000 to 4000 feet elevation. The thick leathery leaves are divided into 3 to 5 leaflets. Flat, creamy-white flower clusters 2 to 6 inches in diameter appear intermittently throughout the year and are followed by dark blue edible berries.

Landscape value: Screen or windbreak, small shade tree but not suitable for patio locations because of messy fruit. Flowering periods can be very showy. Dense and rounded, but somewhat unkempt-looking in general appearance. May be almost leafless in late summer and fall coming to exuberant life in January. Not compatible with many desert plants and seems to belong in mesquite grove situations.

Maintenance requirements and propagation: Responds to deep soil and grows vigorously wherever soil moisture is abundant. The almost deciduous period in late summer can be shortened by deep watering. Old trees often develop heart rot of the trunk.

Western soapberry

Sapindus saponaria

Height: to 25 feet **Spread:** 15–25 feet

Hardiness zones: 3, 4, 5

Description: A small deciduous tree or large bush with long, pointed, yellow-green leaflets. Decorative ½-inch yellow or tan transparent berries are displayed at the branch tips throughout fall and winter months. These berries are poisonous, but because of the exceedingly hard seed coat they are not considered a serious hazard. Soapberry can be found along streams, in canyons, plains and oak woodlands from 2500 to 5000 feet.

Landscape value: Visual screen or windbreak, small shade tree with lush green foliage and interesting fruit clusters. Since it is often associated with intermittent water courses soapberry does not combine well with many plants of the open desert.

Maintenance requirements and propagation: Occasional deep irrigation will insure good growth on low desert sites. Propagate from seed; may require filing to germinate consistently.

Tamarisk

Tamarix aphylla

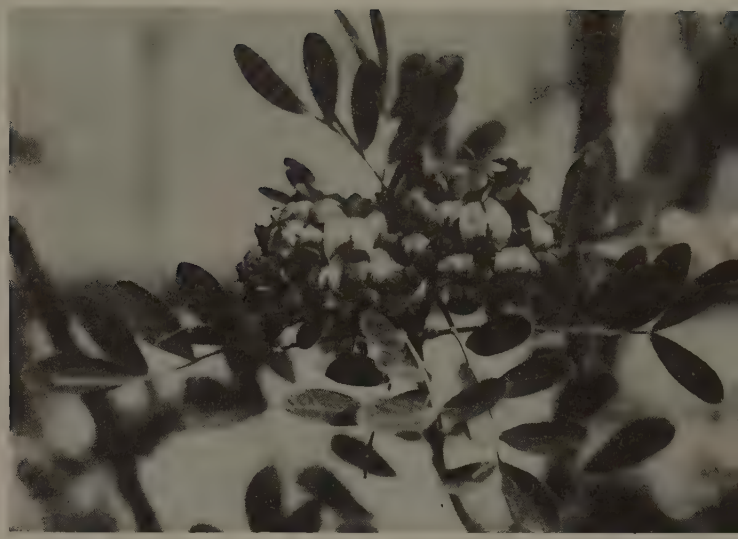
Height: 20–30 feet **Spread:** 20–30 feet

Hardiness zones: 4, 5, warm microclimates in 3

Description: Although not native, this fast-growing, graceful evergreen is frequently seen in the desert surviving on old abandoned homesites long after all other introduced plants have disappeared. For many years it was customary to plant Tamarisk as a windbread in agricultural areas. Tiny scale-like leaves clothe the slender branchlets and delicate white-to-pinkish plumes of flowers appear in late summer.

Landscape value: Effective windbreak, screen or shade tree for harsh desert locations where few other trees in this size category can be grown. Responds well to regular shearing and can be developed into a tightly clipped hedge as low as 3 or 4 feet. Tamarisk has a greedy, invasive root system and an untidy habit of dropping twigs and salty foliage almost year-round. It should not be planted near vegetable or flower beds, underground pipes or sewers, or beside house foundations, patios, or other intensively maintained landscape areas. Foliage litter will stain metal surfaces of automobiles parked beneath the tree.

Maintenance requirements and propagation: Lush and vigorous on good sites with plenty of moisture but once established it can also withstand long periods of drought. A tough tree which tolerates poor alkaline soils, and desert wind and heat. May be damaged by winter temperatures below 10° F. but recovers rapidly the following spring. Large trees should have some of the heavy wood removed to reduce the danger of wind damage.



Texas mountain laurel (Mescal bean)

Sophora secundiflora

Height: 10–20 feet **Spread:** 5–10 feet

Hardiness zones: 3, 4, 5

Description: Large, non-native evergreen shrub or small tree with a short trunk and vase-shaped crown of glossy dark green foliage. Fragrant, violet flower borne in drooping wisteria-like clusters. Produces large grey seed pods which split open to reveal bright red ½-inch seeds. These are poisonous and should be removed before they ripen.

Landscape value: Floral display is impressive, and dark, rich-looking foliage makes a pleasing contrast with other desert vegetation. Well-suited for screening or defining outdoor areas or espalier use. Can be pruned into an elegant small flowering tree for patio, specimen or accent. The sweet fragrance of the flowers adds considerably to the landscape quality of this tree.

Maintenance requirements and propagation: Tolerates poor alkaline soil conditions but reaches its fullest landscape potential in deep, well-drained soil. Regular, thorough irrigation is essential if a small tree is desired.

California fan palm

Washingtonia filifera

Height: 30–50 feet **Spread:** 10–20 feet

Hardiness zones: 4, 5, warm microclimates in 3

Description: Massive fan palm with thick columnar trunk and rounded crown of large grey-green fronds. Old fronds hang down against the trunk and form a thick thatch unless removed periodically. A very rare Arizona native at 2500 feet in a few few canyons of the Kofa Mountains, Yuma County. Common in Riverside and Imperial Valley, California.

Landscape value: A large, stately fan palm of strong character, not suited for use in small urban or suburban gardens. Most effective as a park or boulevard palm or accent in large scale plantings.*

Maintenance requirements and propagation: Good soil and regular deep irrigation are important for landscape effect. Mature specimens of this palm are hardy to approximately 18° F., but they can recover from much colder freezes.

*Other palms which are not native but make excellent subjects for desert landscapes include the date palm, Mexican fan palm and species of Sabal, Erythea and Chamaerops.

Holly-grape (barberry)

Shrubs

Turpentine-bush

Aplopappus laricifolius

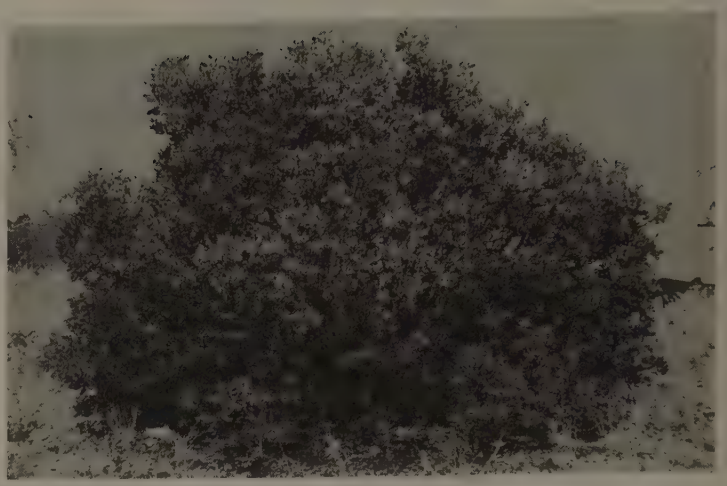
Height: 1½–3 feet **Spread:** 2–3 feet

Hardiness zones: 3, 4, 5

Description: A dense mounding bush with slender resinous bright green leaves. In fall the plant is covered with masses of tiny bright yellow flowers similar to goldenrod. Occurs mostly on rocky slopes and plains and in lower oak woodlands from 2500 to 6000 feet.

Landscape value: Useful small shrub for border, unclipped hedge, space definer, or naturalized on banks where the colorful fall flowering effect is most impressive. The mounding growth habit results in interesting foliage contours. Looks well planted among rocks.

Maintenance requirements and propagation: Grows best in well-drained soils with full sun. Benefits from occasional deep watering in driest weather. Sometimes available from nurseries; can also be grown from seed.



Point-leaf manzanita

Arctostaphylos pungens

Height: to 10 feet (usually lower) **Spread:** 4–10 feet

Hardiness zones: 3, 4, 5

Description: Spreading evergreen shrub or small tree with fantastically crooked and free-flowing branches. The satiny-smooth, paper-thin bark varies in color from rich mahogany-red to purple or chocolate-brown and makes a striking contrast with the leathery gray-green foliage. Clusters of small urn-shaped pink or white flowers appear in late winter and are followed by dark brown fruits in summer and fall. This and other species of manzanita grow on rocky mesas and dry slopes from 3000 to 8000 feet.

Landscape value: Branching pattern and bark color make this a strong accent or specimen shrub. Excellent for massing foundation planting or on banks and combines well with rocks in desert landscapes. Also useful as a background shrub for lower growing plants.

Maintenance requirements and propagation: Good drainage and regular but spaced irrigation through the growing season are quite important, especially at lower elevations where it will be quite marginal. Do not plant in heavy or alkaline soil. Low branches which grow along the ground sometimes develop their own roots. These may be severed from the shrub and transplanted. Can be grown from cuttings, but more difficult from seed.

Four-wing salt-bush (Chamiso)

Atriplex canescens

Height: to 8 feet **Spread:** 6–8 feet

Hardiness zones: 3, 4, 5

Description: A much-branched evergreen bush with grey twigs and foliage. Variable in shape, but often spreading and rounded. This shrub grows over a wide area on dry slopes, in washes and even on salt or alkali flats from sea level to 7000 feet.

Landscape value: Salt-bush serves as a colorful accent plant because of its attractive grey foliage. It is adaptable to clipping or shearing into hedge form. Also a tough, rugged groundcover on steep slopes.

Maintenance requirements and propagation: Very well adapted to withering sun and intense heat of low desert summers. Requires little care other than an occasional deep watering in prolonged dry spells. Plants are male or female. Some shearing to remove old seed heads on female plants will improve year-round appearance. Propagate by seed or cuttings rooted in moist sand.

Holly-leaved salt-bush

Atriplex hymenelytra

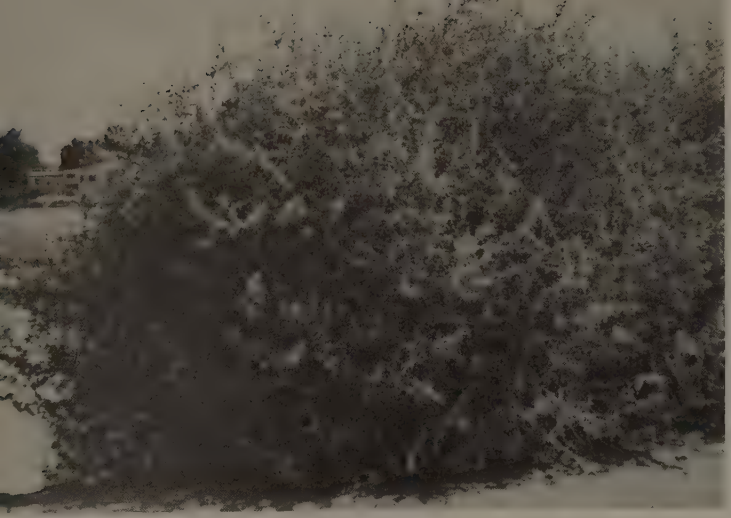
Height: 1–3 feet **Spread:** to 4 feet

Hardiness zones: 4, 5 warm microclimates in 3

Description: Low, rounded evergreen bush conspicuous because of its silvery-white holly-like leaves. Grows naturally in dry, sandy soil and on steep gravelly slopes up to 2500 feet in the Mohave and Colorado deserts. This species was once so widely gathered for use as Christmas foliage that it nearly became extinct in some areas. It is now protected by the Arizona native plant law.

Landscape value: Striking accent or specimen foliage shrub, also effective as an unclipped hedge. The crisp, sometimes almost white foliage and compact growth habit make it especially desirable among rocks and other desert plants. Small red-purple seed bractlets of the female are attractive and further the illusion of a dwarf holly.

Maintenance requirements and propagation: Given good drainage, grows well in most desert situations. Stays dwarf below 1000 feet elevation. Withstands long periods of drought. Water to stimulate growth but withhold it in autumn to encourage silvery grey foliage color. May be grown from seed or cuttings.



Quail-brush (White thistle)

Atriplex lentiformis

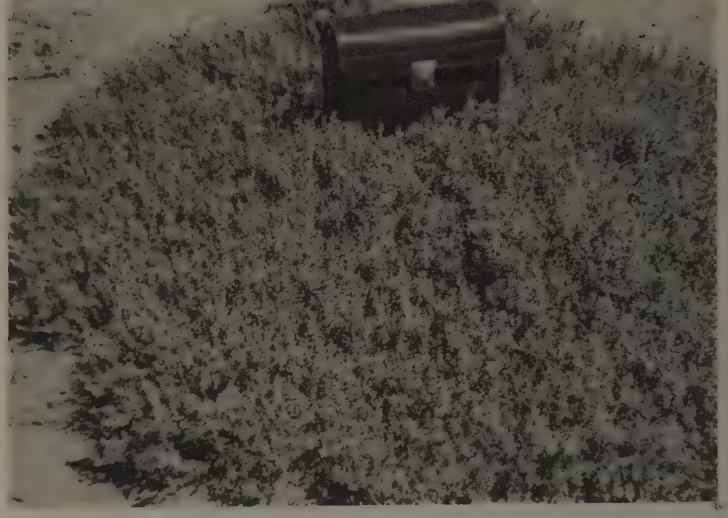
Height: to 10 feet **Spread:** to 10 feet

Hardiness zones: 3, 4, 5

Description: A large, dense grey-green shrub in the salt-bush group found scattered on desert slopes, mesas to 4000 feet; also called Lens-scale.

Landscape value: Handsome bushy shrub with pleasing form and attractive foliage. Excellent for screening or background use. Can also be clipped.

Maintenance requirements and propagation: Salt-tolerant, requiring no special care once established. Landscape appearance much improved by occasional deep watering during the warm months. Prune as needed to keep plant shapely and remove old seed heads. Easily propagated by cuttings rooted in moist sand or by seed.



Australian salt-bush

Atriplex semibaccata

Height: 3–6 inches **Spread:** 24–48 inches

Hardiness zones: 4, 5

Description: Dense, low-growing herbaceous shrub with many slender stems and fine-textured grey-green foliage. Inconspicuous blooms are followed by tiny orange-red fruits. A taller-growing (to 18″) strain of this saltbush has been selected which appears to be slightly hardier to cold but not as drought tolerant. This plant was introduced into the United States as a forage plant many years ago and has now spread over a large area from Texas to southern California. In the southwest deserts it has naturalized at elevations from 1000 to 2500 feet.

Landscape value: The spreading, prostrate growth habit and dense grey-green foliage of this sub-shrub make it useful as a non-walk on groundcover in desert landscapes. Not for a highly refined area because of general rough appearance but effective for erosion control.

Maintenance requirements and propagation: A tough plant, surviving on poor soils with as little as 10 inches of precipitation per year. However, it cannot be maintained as a solid groundcover unless watered on a regular basis. When winter temperatures drop below 25 degrees F. plants will kill back to the ground but they recover the following spring. Even if completely killed by temperatures of 10 degrees F. or lower, the planting may re-establish by seed.

Desert broom

Baccharis sarothroides

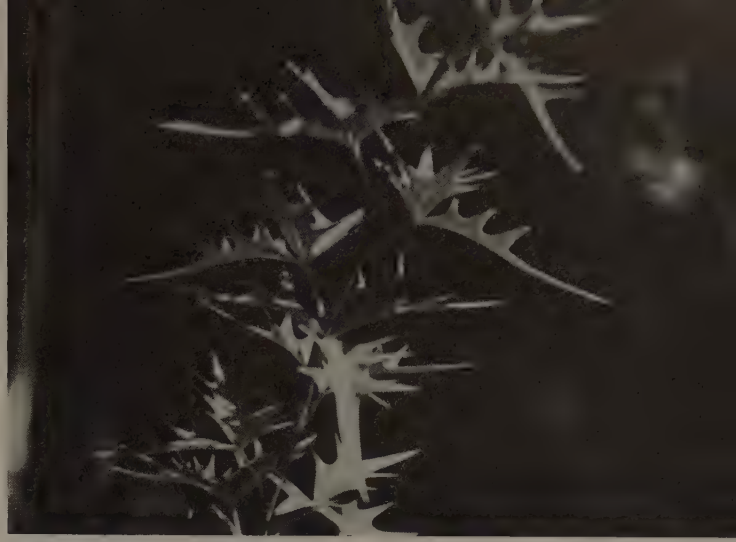
Height: 3–8 feet **Spread:** to 6 feet

Hardiness zones: 3, 4, 5

Description: Rounded, broom-like shrub, an abundant and characteristic plant of washes and roadsides in the desert plains and low hills from sea level to 5000 feet. Male and female flowers are on separate plants. Great masses of fluffy seed heads give female plants a spectacular soft cottony appearance in fall and winter.

Landscape value: Good medium-sized shrub for visual or traffic control, erosion control and street median plantings for minimum maintenance. Combines well with other native plants. Can be pruned into a more compact shrub if so desired. General foliage color is a fresh bright green, unusual among dull colors of many desert plants.

Maintenance requirements and propagation: Deep-rooted and tenacious of life, desert broom thrives in hot, dry situations as well as where there is a little extra soil moisture. Good appearance and color is maintained by some pruning and supplemental watering during long dry periods. Seed heads produced by female plants eventually float away in the wind, creating a temporary problem on terraces and in pools. These can be eliminated by pruning plants before the seeds mature. Cutting-grown male plants, occasionally available from nurseries, are free of seed head litter. These cost more but are worth it.



Holly-grape (Barberry, Algerita)

Berberis (Mahonia) trifoliata

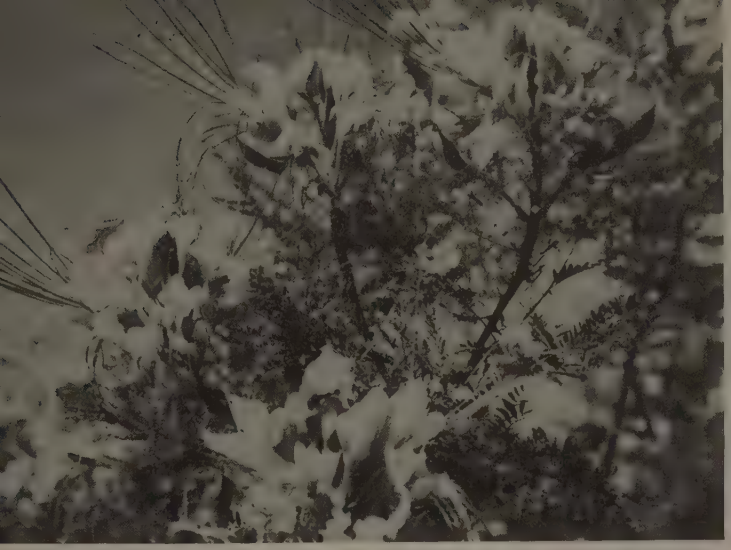
Height: to 8 feet **Spread:** 4–6 feet

Hardiness zones: 3, 4

Description: A rounded, evergreen bush valued for its attractive, blue-green, holly-like leaves. Small yellow flowers and purple or red berries add seasonal interest. Natural range is restricted to dry slopes from 2500 to 8000 feet, sometimes scattered among pinyon and juniper.

Landscape value: Rich, colorful foliage qualities make this an arresting landscape specimen or accent in desert gardens. It also is an attractive container plant.

Maintenance requirements and propagation: Do not plant in tight heavy soils or those that are strongly alkaline. Other than this, no special requirements other than occasional deep irrigation during prolonged dry weather. Propagate from seed.



Yellow Bird-of-Paradise

Caesalpinia gilliesii
(Ponciana gilliesii)

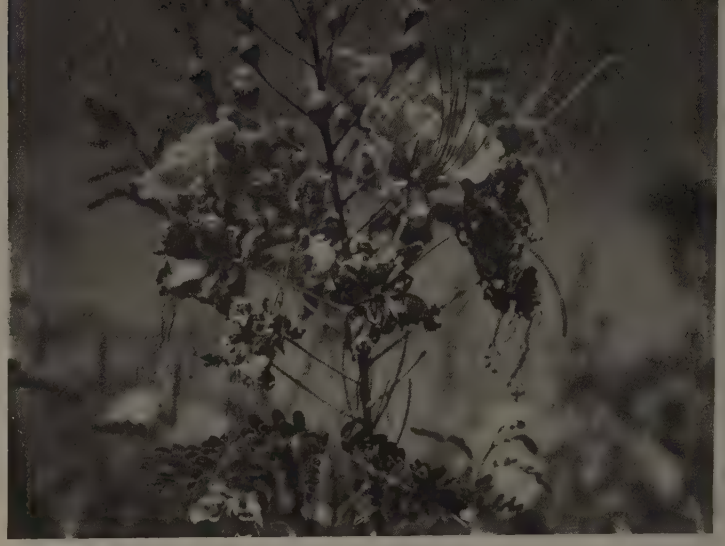
Height: to 10 feet **Spread:** to 6 feet

Hardiness zones: 3, 4, 5

Description: Although not a true native, Yellow Bird-of-Paradise has naturalized in parts of the desert southwest. It has long been grown in desert landscapes, mostly for the large, very showy clusters of yellow flowers with their bright red stamens. These appear over a long period from mid-spring into early fall. The upright, haphazard branching pattern of Yellow Bird-of-Paradise results in an open, unsymmetrical shrub or small tree. The feather-like foliage divides into many small leaflets.

Landscape value: A striking accent or specimen shrub. The exotic flowers produce a showy display of color over an extended period of time.

Maintenance requirements and propagation: Fast-growing and adapted to heat and sun-baked soils. Deep infrequent watering is essential for best growth and flowering. Plants often look tacky after blooming when covered with large seed pods. These split open suddenly, showering seeds in all directions. Prune off faded flowers to avoid an unkept appearance and to extend the bloom period. Easily propagated from seed sown spring or summer directly in the landscape or in pots to develop vigorous transplants. Established plants reseed freely.



Red Bird-of-Paradise

Caesalpinia pulcherrima
(Poinciana pulcherrima)

Height: 3–6 feet **Spread:** to 6 feet

Hardiness zones: 4, 5, warm microclimes in 3

Description: This poinciana is not native to deserts in the United States but grows wild in the adjoining Mexican State of Sonora and south into the tropics. Somewhat lower-growing and denser than *C. gilliesii* here as it can often freeze back. The spectacular flowers of fiery orange-red appear throughout the warm months. It is known also as the Mexican Bird of Paradise.

Landscape value: Exotic flowers provide a very colorful, almost tropical, effect, while the dark green, feathery foliage is useful in massed plantings as a transition between desert and oasis gardens or for silhouette against a stark, bare wall. However, because of its sparse winter appearance, plant with shrubs for year-round interest.

Maintenance requirements and propagation: Well-adapted to the desert, evergreen in open, mild winters but leaves drop and branches freeze back if temperature falls into the midtwenties. For best flowering, prune moderately in late winter. Behavior like a perennial in Zone 3 where it freezes to the ground each winter. This shrub grows rapidly if watered regularly during the growing season. Propagates readily from seed and should be grown 6 to 9 inches tall in a container before planting in the landscape. This species does not naturalize as well as *C. gilliesii.*

Fairy-duster (Calliandra)

Calliandra eriophylla

Height: 1–3 feet **Spread:** to 3 feet

Hardiness zones: 3, 4, 5

Description: Low, densely-branched, semi-deciduous shrub with delicate, fine-textured foliage. Especially conspicuous in spring when the branches are covered with masses of white, rose or reddish-purple puff-ball bloom clusters. Occurs chiefly on dry, gravelly foothill slopes and mesas from 2000 to 5000 feet.

Landscape value: An exceptionally delicate and graceful shrub which contributes a unique flower display lasting 2 or 3 weeks in early spring. Effective as a facer shrub with taller plants or architectural features such as walls, entryways and steps. Also useful as a medium-sized ground cover, or an accent when massed for full floral effect.

Maintenance requirements and propagation: Thrives in desert environments if watered deeply but infrequently. Otherwise the plant is drought-deciduous. Grows readily from seed.

Slim-pod senna (Cassia)

Cassia leptocarpa

Height: 1–2 feet **Spread:** to 2 feet

Hardiness zones: 3, 4, 5

Description: A small, coarse evergreen bush whose greatest landscape asset is the display of bright yellow flower clusters July through September. Grows along streams and washes from 2500 to 5500 feet.

Landscape value: This is strictly a summer-effects plant since it dies back in colder zones and may look poorly in mild winter areas.

Maintenance requirements and propagation: Chief requirements are good drainage and infrequent deep watering. Responds quickly to good summer rains. Propagate from seed and grow seedlings 5 or 6 inches tall in containers before planting in the garden. Sometimes defoliated by caterpillars which can be controlled with most garden insecticides recommended for chewing insects.

Shrubby senna (Cassia)

Height: 5–8 feet **Spread:** 5–10 feet

Hardiness zones: 3, 4, 5

Description: A large, rounded, deciduous shrub with fine-textured, bright green leaves and clusters of clear yellow flowers at the branch tips. Occurs mostly on dry foothill slopes 500-5000 feet.

Landscape value: Colorful flower effects make this a striking accent, specimen or medium-sized background shrub. The warm season is its prime period since the plant looks poor in winter.

Maintenance requirements and propagation: Adaptable and tolerant of a wide range of soil and climatic conditions. Deep infrequent watering improves growth and flowering. Propagates readily from seed. Keep seedlings in small containers until they are growing vigorously, then transplant to a permanent location.

Desert hackberry (Granjeno)

Celtis pallida

Height: 5–10 feet **Spread:** 5–10 feet

Hardiness zones: 3, 4, 5

Description: Dense, spiny evergreen shrub or small tree which is deciduous in cold areas. The inconspicuous flowers are followed by small orange berries in October. These are relished by many native birds. Desert hackberry often grows into a dense thicket, furnishing excellent quail cover. It is found chiefly on desert plains but also penetrates dry washes and canyons from 2000 to 4000 feet.

Landscape value: Effective for background, screen, traffic control or soil erosion control in outlying areas of the landscape. Can be trained into a small tree.

Maintenance requirements and propagation: Once established, grows well in dry gardens with little or no care. Propagate by cuttings rooted in moist sand or from seed if you can collect ripe berries before the birds harvest them.

Smoketree (Indigo-bush)

Dalea spinosa

Height: to 20 ft. **Spread:** 10–20 feet

Hardiness zones: 5

Description: Large shrub or small tree named for the dense growth of silvery-grey branches and spiny twigs which give the plant the appearance of a cloud of smoke from a distance. It is leafless most of the year under natural growing conditions. In late spring great numbers of deep indigo-blue, fragrant blossoms create an arresting floral display. The natural range of smoketree is restricted to gravelly or sandy washes from sea level to 1500 feet. This species is a protected native plant. Collection is strictly controlled by law.

Landscape value: Truly ornamental in the natural landscape as a large accent or specimen shrub. Makes a beautiful tracery pattern against a wall, or use in clumps grouped in the background of a desert garden.

Maintenance requirements and propagation: Most satisfactory and responsive in deep, sandy or gravelly wash-type soils of the low deserts. Too tender for the upper desert valleys. Occasional deep watering is beneficial. Propagate by planting seeds in containers or directly in the desired landscape location. Cannot be transplanted except when first grown in containers.

Indigo-bush

Dalea wislizeni

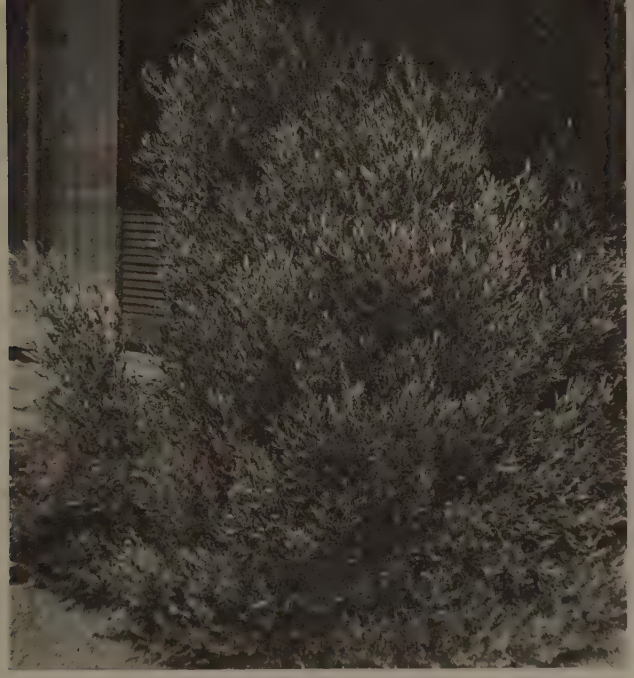
Height: 1–2½ feet **Spread:** 1–3 feet

Hardiness zones: 3, 4, 5

Description: An attractive, low-growing, semi-deciduous shrub with striking rose-purple ball-shaped flowers. Found mostly on rocky slopes from 3000 to 6000 feet.

Landscape value: Unusual merit as a low-growing accent or specimen in desert shrub plantings. Good for bank planting, as it spreads laterally by underground runners developing into a mounding cover.

Maintenance requirements and propagation: Chief requirement is good drainage. Responds well to supplemental watering. Propagate by seed or cuttings rooted in moist sand.



Hopbush

Dodonaea viscosa

Height: 6–8 feet **Spread:** 3–6 feet

Hardiness zones: 5, 4, warm microclimates in 3

Description: A graceful, fast-growing shrub with many upright stems and 2- to 4-inch linear leaves. Inconspicuous flowers are followed by attractive pinkish winged fruit in late summer. Hopbush is found in canyons and on dry rocky north-facing slopes from 2000 to 5000 feet. Also native to regions other than the desert southwest.

Landscape value: The airy leaf pattern and vertical growth habit of this shrub make a pleasing silhouette when displayed against structures and garden walls. Also useful as a background shrub or for defining space in the landscape. Adapts well to trimming and can be pruned into a very attractive formal hedge.

Maintenance requirements and propagation: Adaptable and tolerant of a wide range of soil and climatic conditions but may freeze back in cold winters, even in its natural habitat. Good soil drainage is essential. The purple form often sold in nurseries does not grow wild in this region and is more frost-sensitive than the native type. Growth of both forms is dense and vigorous in good soil with regular, deep watering. Propagate from seed or by cuttings.

Brittle-bush (Incienso)

Encelia farinosa

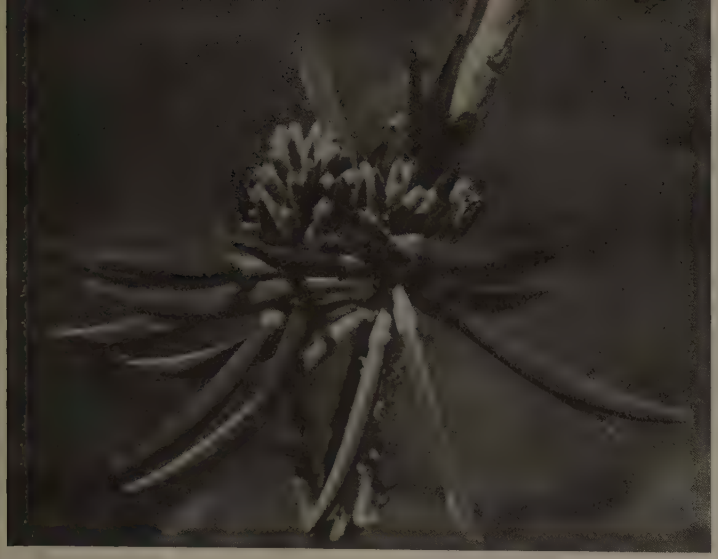
Height: 2–3 feet **Spread:** 2–4 feet

Hardiness zones: 5, warm microclimates of 4. An annual in 3.

Description: Low, compact shrub with many stems bearing dense clusters of gray-green flannel-like leaves. The foliage is almost white when plants are grown with very little water. Its moment of glory comes in early spring when the plant is covered with masses of bright yellow daisies standing well above the foliage on long stalks. Will flower at other seasons if deep-watered after a dry period. Brittle bush is abundant on south and west-facing coarse outwash slopes and dry, stony hills below 3000 feet.

Landscape value: A valuable gray-white accent or border shrub which repeats foothills foliage and makes an effective contrast with darker green plants. The heavy masses of flowers displayed against the foliage provide a unique yellow-gray color combination. Plants that develop tufted appearance have much landscape character.

Maintenance requirements and propagation: Not good in cold locations where it will freeze out, but otherwise a hardy, drought-resistant, sun-loving shrub. If not watered during extreme drought, the plant sheds its foliage or dies out. On the other hand, overwatering in fall results in soft succulent growth that is quite frost-tender. In extremely arid low desert locations, Brittlebush behaves as an annual, reseeding when there are good rains and blooming at almost any season. Needs to be pruned back after blooming. Can be propagated by cuttings or seed. The seed contains an inhibitor which must be removed for consistent germination. This can be done by soaking the seed in a half chlorox-half water solution for one hour followed by a thorough rinse or by washing the seed in running water for six to eight hours. It is best to grow seedlings in small containers for a time before setting out.



Western coral bean (Chilicote)

Erythrina flabelliformis

Height: to 15 feet **Spread:** to 6 feet

Hardiness zones: 4, 5, warm microclimates in 3

Description: Tall, thick-stemmed, spiny shrub or occasionally a small tree with gray-green foliage which is present in summer only. The most notable feature of this plant is its spring display of brilliant red or scarlet tubular flowers in clusters of 3 to 5 or more. The bean pods which follow are up to 10 inches long and contain several bright red seeds. These are sometimes strung as beads even though they are quite poisonous when the outer seed coat is broken. Coral bean is commonly found on dry, warm rocky hillsides and in foothills washes and canyons from 3000 to 5000 feet.

Landscape value: An interesting and unusual accent or specimen shrub grown mostly for its spectacular flowering effects. The foliage is lush-appearing while it lasts, but the plant is deciduous for a long period. The leaves turn an attractive yellow-orange in the fall. A small tree in frost free areas.

Maintenance requirements and propagation: Coral bean is sensitive to frost, and branch dieback is common following cold winters. Although undemanding, this shrub responds well to regular deep irrigation during the growing season. Easily propagated from scarified seed sown in summer.

Ocotillo (Coachwhip)

Fouquieria splendens

Height: to 15 feet **Spread:** 5–10 feet

Hardiness zones: 3, 4, 5

Description: No native tree or shrub contributes more to the character of the Sonoran Desert than does this stark, picturesque plant. In spring its spiny, erect stems are tipped with clusters of flaming-red flowers. The small, dark green leaves appear following rainfall during any of the warmer months, but they are short-lived, falling quickly as the soil dries. Ocotillo is most abundant on dry, rocky hills and coarse outwash slopes up to 5000 feet. This is a protected native plant species. (See page vi, Native Plant Law.)

Landscape value: The cluster of thorny branches all springing from the base can create a dramatic silhouette against a wall or skyline setting. It makes an eye-catching specimen or accent when used in this manner. An impenetrable living fence can be developed by planting a closely spaced row of ocotillo stems or plants.

Maintenance requirements and propagation: This plant has a remarkable capacity for life under adverse conditions and requires no care once established in the desert garden. Older plants can be killed by overwatering. Readily propagated by planting stem tip cuttings of any length in spring or early summer and watering occasionally until new growth appears. Even old plants transplant easily without much of the original root system.

Limberbush (Sangre de Cristo)

Jatropha cardiophylla

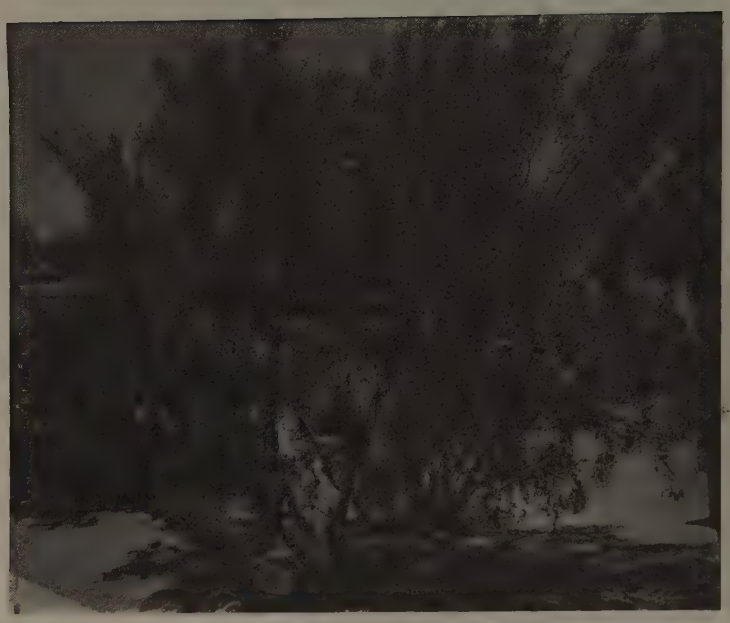
Height: to 3 feet **Spread:** 2–4 feet

Hardiness zones: 4, 5

Description: An unusual small shrub with flexible upright stems, often spreading by running rootstocks. Under natural arid conditions, the plant is leafless much of the year. Even so, the meaty-looking, dark brown stems and branches are quite interesting. Glossy heart-shaped foliage appears following warm summer rains or irrigation in June but sheds as the soil dries. Limberbush is found growing as individual plants or in small colonies on dry plains and in foothills from 2000 to 3000 feet.

Landscape value: A low-growing shrub which combines well with native trees and shrubs in group plantings for desert effects. The unusual bare twig and alternate leafy periods make it a unique container plant.

Maintenance requirements and propagation: A tough durable shrub, well adapted to desert soils and climate. Retains foliage for extended periods if watered during the warm part of the year. Propagation by seed and underground runners.



Creosote-bush (Greasewood, Hedionilla)

Larrea divaricata

Height: 4–10 feet **Spread:** 4–10 feet

Hardiness zones: 3, 4, 5

Description: An irregular evergreen shrub which dominates much of the southwest's desert landscape from near sea level to 5000 feet in California to Texas and Mexico. On poor, dry sites creosote bush is straggly and open with upright branches gradually bending down with age. Where moisture is more abundant, it grows into a dense rounded bush. The glossy foliage has a distinctive pungent odor, especially after a rainshower. Small, bright yellow flowers appear intermittently all year, and are replaced by fuzzy white seed pods.

Landscape value: Rather loose, open shrub but effective visual or wind screen and good as a filler plant in desert plantings on banks and to rejuvenate denuded desert sites. Occasionally used for a clipped hedge with moderate success.

Maintenance requirements and propagation: Tolerates alkaline soils and thrives in intense desert heat. Occasional deep irrigation promotes dense foliage and heavier flowering but the plant can survive many months of drought. Slow and difficult to grow from seed. Small wild seedlings can be weaned from open desert via pots.

Texas Ranger (Texas Sage)

Leucophyllum frutescens

Height: 4–8 feet **Spread:** to 8 feet

Hardiness zones: 3, 4, 5

Description: Dense, rounded, gray-leaved shrub native to Texas and Mexico. Masses of rose-purple flowers provide bright splash of color in late summer and early fall whenever it rains or the plant is watered.

Landscape value: Not native to the Sonoran Desert, but well adapted and widely used throughout the desert southwest. Excellent for hedging, defining spaces, screening and for colorful accent in desert landscapes. Fall blooming habit provides extra interest and color at a time when few other shrubs are in flower. The beautiful pearly-gray foliage provides a striking landscape note at any season.

Maintenance requirements and propagation: A drought-tolerant shrub, but should have regular deep watering to look its best in low desert areas. Not fussy as to soil. Develops an attractive natural contour but responds well to shearing. Readily available from nurseries. A compact form is available. Can be propagated from cuttings or seed.

Sugarbush (Sugar Sumac)

Rhus ovata

Height: to 15 feet **Spread:** to 15 feet

Hardiness zones: 3, 4, 5

Description: A rounded, spreading evergreen shrub which may grow into a small tree under the most favorable conditions. The leathery dark green foliage serves as an effective background for clusters of small pink buds and white flowers appearing in April. This is a characteristic chaparral plant found on mountain slopes and mesas from 3000 to 5000 feet.

Landscape value: A large, sturdy shrub of rich foliage color and texture, useful for mass planting, screening and background effects.

Maintenance requirements and propagation: Strong growing and adaptable to adverse conditions but requires deep infrequent irrigation in most desert situations. Young plants are best set out in fall or winter. Some summer watering is needed, but young shrubs and even older plants are subject to damping-off if kept too wet in warm weather when they are semi-dormant. Can be propagated from seed, but the danger of damping-off makes nursery-grown plants more practical.

Arizona sophora

Sophora arizonica

Height: to 10 feet **Spread:** 5–10 feet

Hardiness zones: 3, 4, 5

Description: A large bush with fragrant, pale purple or pinkish wisteria-like flower clusters. Grows on dry, rocky hillsides and wash banks from 2000 to 4000 feet in western Arizona. The glossy light-green leaves are densely arranged along the stems.

Landscape value: Handsome foliage and elegant blossoms make this a native plant of special landscape potential for accent or specimen use.

Maintenance requirements and propagation: Adaptable to a wide range of growing conditions and soils. Slow to develop but can be encouraged with regular deep irrigation and light feeding during the growing season. Grows easily from seed. Nursery plants are available occasionally.

Jojoba (Goatnut coffeeberry)

Simmondsia chinensis

Height: 4–8 feet **Spread:** 4–8 feet

Hardiness zones: 4, 5, warm microclimates in 3

Description: Distinctive evergreen shrub valued chiefly for its dusty grey-green leathery leaves and spreading, rounded form. Male and female flowers are borne on different plants, and both must be present for the female to produce its edible, acorn-like seeds. Occurs in the desert foothills from 1000 to 4300 feet.

Landscape value: One of the few desert shrubs adapted to formal landscape settings because of its dense, mounding growth habit which tolerates clipping and shaping. Unusual in that it lacks thorns of any kind. Excellent as a foundation plant, background shrub, or useful for bank planting.

Maintenance requirements and propagation: A very drought resistant plant but more responsive in desert gardens if deep watered occasionally in hot, dry weather. Small plants are somewhat cold sensitive, but the mature shrub is hardy to 15° F. Propagates easily from seed sown in the warm part of the year. May be planted directly in the ground or grown first in a pot and then set out.

Yellow Trumpet Bush (Arizona Yellow Bells)

Stenolobium stans
(Tecoma stans)

Height: 5–15 feet **Spread:** 4–8 feet

Hardiness zones: 4, 5, warm microclimates in 3

Description: An attractive shrub with graceful dark-green foliage and bright yellow trumpet-shaped flowers appearing at the branch tips May through October when soil moisture is adequate. Found on dry rocky slopes, 3000 to 5000 feet up.

Landscape value: The fresh green foliage of this shrub contrasts well with many gray-green desert plants. It is a good color plant for summer, useful and attractive in both desert and oasis landscape settings as a single specimen plant or mixed in with background shrubs. The flowers are very attractive to hummingbirds.

Maintenance requirements and propagation: Thrives in most situations if watered deeply at regular intervals during the growing season. The elevation of its natural habitat is misleading, for it is relatively tender and generally freezes back if the temperature dips into the mid-twenties. Renews itself vigorously from below ground in spring. Grows readily from seed sown in spring.

Salt-cedar

Tamarix pentandra

Height: 10–20 feet **Spread:** to 15 feet

Hardiness zones: 3, 4, 5

Description: Large deciduous shrub or small tree with narrow upright or rounded crown of slender branches and fine-textured blue-green foliage. Not native but widely naturalized and growing in dense stands along streambeds and irrigation ditches from sea level to 5000 feet. Dainty one to two inch pink flower spikes appear at the branch tips March through August.

Landscape value: Rugged, informal screen or space divider for poor soil situations. Also used to control soil erosion, but do not plant where its aggressive spreading habit can create a problem of control. Delicate foliage which turns yellow-orange in fall and airy flower clusters provide seasonal interest.

Maintenance requirements and propagation: Survives in dry shallow or salty soils, but very responsive to improved soil and moisture conditions. Prune severly in late winter to keep the plant more presentable and to encourage heavier flowering which takes place on current season's wood. Because of its invasive root system, this plant should not be used near vegetable or flower gardens. Easily propagated by seed, cuttings, and small transplants from stands of wild trees.

Arizona rosewood

Vauquelinia californica

Height: 10–30 feet **Spread:** 5–15 feet

Hardiness zones: 3, 4, 5

Description: Large evergreen shrub or small tree with twisted, upright branches and narrow, leathery leaves of bright green. Small white flowers in dense 2- to 3-inch clusters appear in May and June. Arizona Rosewood is found in canyons and on hillsides of the upper desert and lower oak woodlands from 2500 to 5000 feet.

Landscape value: Because of its rich evergreen foliage, this handsome native is very striking as a specimen shrub, small tree, or accent plant. Normally dense and bushy from the base upward, Rosewood is useful for massed planting, or boundary hedging in desert landscapes. In general, it fills the same function as oleander. Although the flowers are not as showy, they are attractive in a low-key way. Rosewood is also more tolerant of drought than oleander.

Maintenance requirements and propagation: Deep, well-drained soil and regular irrigation are important. Can be propagated by seed but should be grown to gallon-can-size before setting out. Available in nurseries.

Hummingbird Trumpet

Zauschneria latifolia

Height: 12–14 inches **Spread:** 8–10 inches

Hardiness zones: 3, 4, 5

Description: An upright herbaceous perennial with brillant red 2- to 3-inch fuschia-like flowers from early summer through late fall. Found in damp places in canyons from 2500 to 7000 feet.

Landscape value: Provides a massive display of scarlet flowers throughout the difficult summer months in southwest desert climates. Good for use in container areas where it requires regular watering. It will spread by underground runners and eventually form a tough mat of roots. Can be used as a ground cover or bank plant, and in containers.

Maintenance requirements and propagation: Thrives in full sun with little maintenance other than regular irrigation. Given good soil and reasonable care, it can cover large areas quickly. Propagated by seed, cuttings, or divisions of old clumps in winter.

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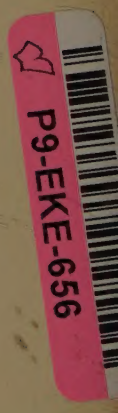
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